NOV 10 1884
299 Post.

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART.

VOL. XVI. — No. 463.] SATURDAY, NOVEMBER 8, 1884. [PRICE, 15 CENTS.

BARTLETT, HAYWARD & CO.
(Established, 1836.)
ARCHITECTURAL IRON-WORK,
HOT-WATER HEATING.
Plans and Specifications and the Superintendence of the Heating and Ventilation of Public Buildings a specialty.
BALTIMORE, MD.

W. & J. SLOANE,
ARTISTIC CARPETINGS,
— AND —
UPHOLSTERY GOODS,
ANCIENT AND MODERN ORIENTAL RUGS.
BROADWAY, EIGHTEENTH AND NINETEENTH STS.,
NEW YORK.

[ESTABLISHED 1866.]
NOVELTIES IN CARPETS,
STANDARD, FOREIGN AND DOMESTIC,
RUGS, MATS and WINDOW-SHADES.
Communications Solicited.
H. A. HARTLEY & CO., BOSTON, MASS.
95 TO 105 WASHINGTON STREET.

OXLEY, GIDDINGS & ENOS,
Designers and Manufacturers of
GAS-FIXTURES,
ART METAL-WORK,
CLOCKS AND BRONZES,
Special designs and estimates furnished upon application.
Architects' patronage most respectfully solicited.
224-230 CANAL STREET, } NEW YORK.
120-126 WALKER STREET, }

T. ASPINWALL & SON,
TILES of all descriptions for Floors, Walls, Hearths, Fireplaces and Decoration generally.
MANTELS, GRATES, AND OPEN FIREPLACES.
BRASS FENDERS, ANDIRONS, ETC.
Sole Agents for, and only direct importers of MINTON'S and the CAMPBELL TILE CO.'S TILES.
75 & 77 W. 23d St., (Masonic Temple) NEW YORK.

PHOTOGRAPHS.
NEW SETS JUST ISSUED.
Set No. 5, 26 Views of Elegant Residence Interiors.
" " 6, 26 " Suburban Homes, (of moderate cost.)
" " 7, 26 " Chicago and Milwaukee Residences, (just built).
$12.00 per set. $10.50 unmounted.
Freights paid if Cash accompanies your Order.
J. W. TAYLOR,
ARCHITECTURAL BOOKSELLER AND PUBLISHER,
146 LA SALLE ST., CHICAGO.

OHIO BUILDING STONE CO.
QUARRYMEN AND DEALERS IN
BUFF AND BLUE OHIO SANDSTONE.
OFFICES:
127 SUPERIOR STREET, CLEVELAND, O.
BRANCH OFFICES:
247 BROADWAY, NEW YORK, N. Y.
350 FIFTH AVENUE, CHICAGO, ILL.
49 FIFTH AVENUE, PITTSBURGH, PA.

SPANISH TILES "NOLLA'S."
The best colors and hardness ever produced in Flooring Tiles. *Original Designs for every Work.*
FERNANDO MIRANDA, Sole Agent in U. S.
92 Liberty Street, New York, N. Y.

CHARLES R. YANDELL & CO.,
MANUFACTURERS OF
ILLUMINATED LEATHERS
AND HAND-PAINTED WALL-PAPERS,
Select Textile Fabrics, Choice Furniture,
Dealers in Antique Spanish Leathers, Bric-à-brac, etc.
DECORATIVE ARTISTS.
No. 6 EAST EIGHTEENTH ST., NEW YORK.
Near Fifth Avenue.

Established 1817.
JOHN H. PRAY, SONS & CO.,
FOREIGN AND DOMESTIC
CARPETINGS AND RUGS.
Correspondence specially invited.
558 WASHINGTON STREET, BOSTON, MASS.

MITCHELL, VANCE & CO.
Designers and Manufacturers of
GAS FIXTURES,
ORNAMENTAL METAL WORK, CLOCKS AND BRONZES.
ARCHITECTS' ORDERS SOLICITED.
Special designs submitted on application.
WAREROOMS, 836 and 838 BROADWAY,
MANUFACTORY, 24th and 25th STS. and 10th AVENUE,
NEW YORK.

AMERICAN ENCAUSTIC TILE.
Acknowledged by experts to be
THE BEST IN THE WORLD.
Manufactured by the
AMERICAN ENCAUSTIC TILING CO. (Limited.)
OFFICE & SALESROOM, 116 WEST 23D ST., N. Y.
Designs and Estimates for Public Buildings, Halls, Churches, Vestibules, and for External Decoration, Bath-room, Stove, and Furniture Decorations.
GLAZED AND ENAMELLED TILES
FOR MANTELS, HEARTHS, WAINSCOTING, ETC.

JAMES P. WOOD & CO.
JAMES P. WOOD. JOSEPH WOOD.
STEAM-HEATING, VENTILATING, AND COOKING APPARATUS, ETC.
39 SOUTH FOURTH STREET, PHILADELPHIA, PA.

SEYSSEL ROCK ASPHALT.
FOR SIDEWALKS, FLOORS, CELLARS, ROOFS, ETC.
BITUMEN DAMP COURSE.
DAMP RESISTING SOLUTION.
ACTINOLITE ROOFS,
29 Waverley Place, NEW YORK. } E. H. WOOTTON N. Y. Mastic Works. { Arcade Bldg, E'ms 14, 16 & 17, CHICAGO.

MINTON'S TILES.
PLAIN AND ENCAUSTIC,
FOR PUBLIC BUILDINGS AND DWELLINGS,
As laid by us in
THE CAPITOLS AT WASHINGTON & ALBANY,
And in numerous Churches, Banks, and Dwellings in every part of the country.
Glazed and Enamelled Tiles for Mantels, Hearths, Wainscoting, etc., and for Exterior Decoration.
MILLER & COATES,
279 PEARL STREET, NEW YORK.

ROBERT C. FISHER,
Successor to FISHER & BIRD,
MARBLE AND GRANITE WORKS.
97, 99, 101 and 103 EAST HOUSTON STREET.
Established 1830. NEW YORK.

THE UNITED STATES ENCAUSTIC TILE CO., Indianapolis, Ind.
PLAIN, GEOMETRICAL & ENCAUSTIC
TILES, FOR FLOORS
Public Buildings and Private Residences.
HIGH ART MAJOLICA TILES for Mantel Facings, Friezes, Furniture, etc.
GLAZED AND ENAMELLED TILES for Hearths, Stoves, Wainscoting, etc.
Designs and Estimates furnished upon application.
New Pattern Book and Price List just issued.

RENDLE'S
HORTICULTURAL AND
SKYLIGHT WORKS.
SKYLIGHTS, CONSERVATORIES, PLANT-HOUSES, GRAPERIES, WINTER-GARDENS, ETC.,
Erected and Glazed, on
RENDLE'S PATENT "ACME" SYSTEM.
For Illustrated Catalogues, Estimates, etc., address,
ARTHUR E. RENDLE,
UNITED BANK BUILDING, BROADWAY & WALL ST.
NEW YORK.

WHITTIER MACHINE CO.
Manufacturers of Steam and Hydraulic
ELEVATORS,
STEAM ENGINES, BOILERS, AND MACHINERY.
1176 TREMONT STREET, BOSTON.
CHAS. WHITTIER, *Pres't.* A. C. WHITTIER, *Treas.*

L. S. GRAVES & SON,
PASSENGER AND FREIGHT
ELEVATORS.
NOISELESS, SAFE AND DURABLE
CENTRE STREET, ROCHESTER, NEW YORK.
NEW YORK OFFICE, 46 COURTLAND STREET.

STOKES & PARRISH,
30th & CHESTNUT STS., PHILADELPHIA, PA.
Hydraulic and Steam-Power
ELEVATORS.
SAFETY, SPEED, AND ECONOMY.
All kinds of Hoisting Machinery a specialty.
NEW YORK OFFICE, - - 95 & 97 LIBERTY STREET.

CRANE'S
VICTORIOUS HYDRAULIC AND HIGH SPEED STEAM
ELEVATORS.
NEW YORK OFFICE, 92 & 94 LIBERTY ST.
BOSTON OFFICE, ROOM 83 MASON BUILDING.
CHICAGO WORKS, 10 N. JEFFERSON ST.

OTIS
PASSENGER AND FREIGHT
ELEVATORS,
A SPECIALTY FOR A
QUARTER OF A CENTURY.
For Hotels, Office-Buildings, Stores, Warehouses Factories, Mines, Blast-Furnaces, etc.
OTIS BROTHERS & CO.,
NEW YORK, BOSTON, AND PHILADELPHIA.

POPULAR BECAUSE RELIABLE.

AUSTIN'S PATENT

Expanding Conductor,

OR LEADER.

The ORIGINAL and only LEGITIMATE EXPANDING CONDUCTOR in the market, has been used for years and THOROUGHLY TESTED in all the PRINCIPAL CITIES and TOWNS in the UNITED STATES and is SPECIFIED by ARCHITECTS generally THROUGHOUT THE COUNTRY.

Austin, Obdyke & Co., Philadelphia,

SOLE MANUFACTURERS.

PRINCIPAL AGENTS.

S. D. Hicks & Son,	Boston.	B. G. Carpenter & Co.,	Wilkesbarre, Penn.
M. Halliday,	New York City.	The Miller Iron Co.,	Providence, R. I.
Bruce, Cook & Co.,	" "	Sanford Bros.,	Newark, N. J.
Sidney Shepard & Co.,	Buffalo, N. Y.	Knisely & Miller,	Chicago.
Wasson & Martin,	Albany, N. Y.	J. C. McFarland & Co.,	Chicago, Ill.
Hoy & Co.,	Albany, N. Y.	Wm. Fuller & Co.,	Baltimore, Md.
Reardon, Ennis & Co.,	Troy, N. Y.	W. R. Allen & Co.,	San Francisco, Cal.
Troy Stamping Works,	Troy, N. Y.	Bakewell & Mullins,	Salem, Ohio.
Chas. Millar & Son,	Utica, N. Y.	Biersack & Neidermeyer,	Milwaukee, Wis.
W. H. Scott,	Portland. Me.	The Blodgett & Clapp Co.	Hartford, Conn.
J. W. Jordan,	Worcester, Mass.		

CARD.

By decisions of the U. S. Circuit Courts the *Exclusive Right* to manufacture *Expanding Conductors of any and all designs*, was secured to WILLIAM AUSTIN, and AUSTIN, OBDYKE & Co. are the only parties authorized to manufacture under Austin's Letters Patent, — all others will be considered and treated as

INFRINGERS.

THE ONLY REAL

Expanding Conductor.

Guaranteed no Infringement.

The IRWIN & REBER PATENT

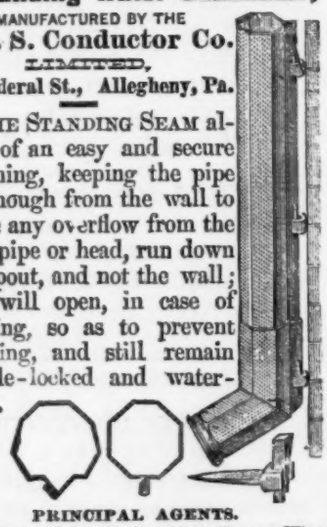
Expanding Water Conductor,

MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

47 Federal St., Allegheny, Pa.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the cave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

PRINCIPAL AGENTS.

E. B. Badger & Son, Boston, Mass.; Noyes & Wines New York; J. S. Thorn, Philadelphia; John G. Hetzell, Baltimore; R. P. Gormully, Chicago; F. Schmitt & Sons, Milwaukee; Shackelton Bros., Cleveland; G. H. Peters & Son, Buffalo, N. Y.; James Ackroyd, Albany, N. Y.; Witt & Brown, Cincinnati; Hull & Cozzens Man'f'g Co., St Louis, A. K. Sweet, Kansas City Mo., and many others.

ALFRED BOOTE,

East 19th Street, New York.

TILES

Of all descriptions, from

MINTON'S, MAW'S, and BOOTE & CO'S.

MOSAICS in Stock and made to order from any design. Large Stock of

Mantels, Grates, & Open Fireplaces.

Special designs made to suit customers free of charge. Experienced men kept to set Mantels, Grates, and Tiles.

MINTON, HOLLINS & CO.,

STOKE-UPON-TRENT.

The original and existing Manufactory of

MINTON'S

Plain, Encaustic, Glazed, Enamelled, Majolica, Printed and Art-Painted Tiles, for Floors, Walls, Hearths, Mantels, Furniture, &c. Illustrated sheets of newest designs just issued.

SHARPLESS & WATTS, Agents,

No. 1325 MARKET STREET, PHILADELPHIA, PA.

BEST CONDUCTOR OF ALL,

Ritchie's Patent Spiral Lock-Seam Pipe,

NO SOLDERED JOINTS.

BOSTON SPIRAL-TUBE WORKS, LAMB & RITCHIE, Proprietors.

See our Advertisement last week.

A. L. FAUCHERE & CO.

Office and Warerooms,

433 AND 435 SEVENTH AVENUE, next to south-east corner Thirty-fourth Street,

Importers, Manufacturers, and Dealers in all kinds of FOREIGN AND DOMESTIC MARBLE FOR INTERIOR WORK.

Estimates furnished on application.

Architects, Builders, and others will confer a favor on the Publishers by mentioning "The American Architect and Building News" when sending for circulars or corresponding with parties advertising in these columns.

Stained Glass.

W. J. McPHERSON,

PLAIN, DECORATIVE, DOMESTIC AND ECCLESIASTICAL

Stained & Leaded Glass Manufacturer.

440, 442 & 444 TREMONT STREET.

N. Y. Office: 26 Warren St., LINSLEY PIKE & CO.

EST. LONDON, ENG., 1854.

Works, 20 W. 4th St., N. Y.

Beautiful & Lasting for ORNAMENTING WINDOWS, DOORS, TRANSOMS, &c.

Stained Glass SUBSTITUTE

AT SMALL COST. Send for Illustrated Catalogue and Prices. Samples by mail 25 cents.

W. C. YOUNG SOLE AGENT, 731 ARCH ST. PHILADELPHIA, PA.

AGENTS WANTED EVERYWHERE.

Stained Glass.

SAMUEL WEST,

471 Tremont St., Boston,

Artist in Stained Glass

FOR ALL GRADES OF ORNAMENTATION.

Memorial Windows a specialty.

Awards of the highest merit for thirty years past.

KELLEY & COMPANY,

ECCLESIASTICAL AND DOMESTIC

STAINED GLASS,

27 Pearl Street, Boston, Mass.

METAL -WORKERS IN BRASS, BRONZE, & STERLING SILVER.

ARTISTIC STAINED GLASS

* * * *

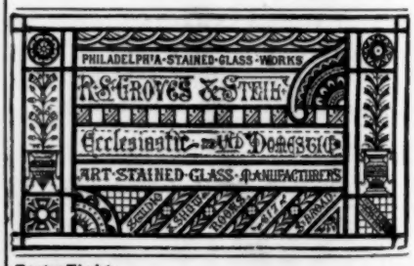
NEW DESIGNS. Send for Hand-Book, to

J. & R. LAMB, 59 CARMINE ST., NEW YORK.

Donald MacDonald, Agt.,

Glass Stainer and Decorator.

Studio and Works, 400 Northampton St.



Forty-Eight.

GEO. R. CLARKE & CO.,

Art Furnishing Rooms,

48 Boylston Street - - Boston, Mass.

Stained Glass Designers & Workers.

Tiles for Floors, Walls, Hearths, Facings, etc. Tiles designed and painted to order. Marquetry Floors. Furniture Designers and Manufacturers. Designs and estimates furnished on application. Glass works on the premises

REDDING, BAIRD & CO.,

SUCCESSORS TO COOK, REDDING & CO.,

Manufacturers of

STAINED GLASS

IN ALL ITS VARIETIES. IMPORTED

ROLLED CATHEDRAL GLASS

of our own importation furnished in any quantity and cut to size.

146 FRANKLIN ST., BOSTON, MASS.

J. G. & J. F. LOW, Chelsea, Mass.

LOW'S ART TILES.

New York, Caryl Coleman, No. 9 East 17th St.
Chicago, Henry Dibblee, 266 and 268 Wabash Ave.
Boston, C. A. Wellington & Co., 44 Boylston St.
Cincinnati, C. S. Rankin & Co., West Pearl St.
Cleveland, A. S. Herenden Furniture Co., Bank St.
Detroit, F. H. Probasco & Co., 201 Woodward Ave.

REPRESENTED BY

Washington, Hayward & Hutchinson, Ninth St.
San Francisco, W. W. Montague & Co., Market St.
Minneapolis, Sullivan & Farnham, Third St., So.
Omaha, Milton Rogers & Sons, Farnam & 14th Sts.
Louisville, J. V. Escott & Sons, Fourth Ave.
St. Louis, Seidel & Schoenle, So. Fifth St.
Milwaukee, Mathews Bros.
Phila., W. H. Harrison & Brother, 1435 Chestnut St.
Pittsburgh, L. H. Smith & Co., 49 Sixth St.
Syracuse, Hawley, Whitaker & Co., 83 S. Salina St.
Montreal, P. Q., J. Wright & Co., 9 Beaver Hall St.

Stained Glass.

The La Farge DECORATIVE ART CO.

33 East 17th Street, New York.
Contracts taken large or small for
MEMORIAL STAINED GLASS WINDOWS,
Stained Glass of Every Description,
Mosaic, Repoussée, Wood Carvings, Embroideries, and Hangings, for either
Ecclesiastical or Domestic Purposes,
and every kind of Interior Decoration for Public or Private Buildings.
Examples of Mr. La Farge's work may be seen at:—Trinity Church, Boston. St. Thomas's Church, N. Y. Memorial Hall, Harvard College. The Brick Church, N. Y. Garfield Memorial, at Williams College.
And the following private residences:—W. H. Vanderbilt, Cornelius Vanderbilt, N. Y. Cyrus W. Field. S. J. Tilden, N. Y. F. L. Ames, Boston.

S. S. MARSHALL & BROS.,
Manufacturers of
STAINED GLASS.
No. 62 CEDAR AVENUE, ALLEGHENY, PA.

CLEVELAND
Stained Glass Works.
GEO. DRAKE, Proprietor,
99 and 101 Public Square, Cleveland, Ohio.

MY 100-PAGE ILLUSTRATED
CATALOGUE of BOOKS
On Architecture, Building, Carpentry, Drawing, Painting, Decoration, and Ornament, Drawing Instruments, Builders' Level and Architects' Materials,
Sent on receipt of three two-cent stamps.
WM. T. COMSTOCK, 6 Astor Place, New York.

Decorators.

Friederichs & Staffin,
Plain, Decorative, Domestic, and Ecclesiastical
Stained and Leaded Glass
MANUFACTURERS,
For Churches, Dwellings, etc.,
107 & 109 Gratiot Ave., DETROIT, MICH.

ALFRED GODWIN & CO.
STAINED GLASS
For Churches, Dwellings, &c.
Send for Illustrated Catalogue.
1201 Market Street, Philadelphia.

RUTZLER & BLAKE,
HIGH AND LOW PRESSURE
Steam Heating Apparatus,
170 & 172 Centre St., New York.
E. RUTZLER, Established 1871. G. W. BLAKE, Established 1854.

[Established 1816.]
WILLIAM STRUTHERS & SONS,
Contractors for the Marble-Work of new City Hall, Philadelphia,
Importers, Workers and Dealers in
Marbles, Granites
AND OTHER STONES.
Agents for the Caën Stone and Aubigny Quarries, France.
PHILADELPHIA, PA.
☞ Sculptural Work a Specialty.
WM. STRUTHERS & SONS.

C. H. GEORGE, Importer.
PAPER HANGINGS.
Exclusive Upholstery Goods and Decorations.
152 5th Avenue, New York.

MASKINS
FINE DRAPERIES
RARE
CURTAIN FABRICS
CENTRAL MUSIC HALL.
CHICAGO.

W. J. McPHERSON,
Established A. D., 1845.
Painter, Glazier, Designer, and Ecclesiastical
DECORATOR.
440, 442 and 444 Tremont Street.

FRANK HILL SMITH,
171 1-2 TREMONT STREET,
BOSTON.....MASS.

MODELLING, CARVING & DESIGNING
For Interior and Exterior Decoration.
Bronze, Wood, Plaster, Stone and Marble.
J. HOLMES, Hotel Chapman Boston.

OTTO GAERTNER,
Fresco Painter, Interior Decorator.
47 LAFAYETTE PLACE, NEW YORK.

Established A. D. 1848.
L. HABERSTROH & SON,
Mural Decorators,
PAINTING IN ALL ITS BRANCHES.
28 School Street, Rooms 10 & 11, **Boston, Mass.**
20 Bellevue Ave., Near Kay St., **NEWPORT, R. I.**

WALKER & THOMPSON,
Decorative Art Leather and
LEATHER PAPER.
Embossed, Illuminated and Plain Leather-Work of all kinds, for Furniture and Interior Decorations.
No. 4 BOND STREET, NEW YORK.

J. PASQUALI & C. AESCHLIMANN,
Manufacturers of Roman and Venetian
Marble Mosaics,
For Floors, Walls, Ceilings, Mantels, Hearths, Decorations, etc. **231 East 28th St.,** Bet. 2d & 3d Aves. N. Y. Prices very moderate. *References:* Principal Architects and decorators of N. Y. *Note.*—A party advertising to have superintended all work of this nature in N. Y. has never superintended any work there.

H. EDGAR HARTWELL
28 West 23d St., N. Y. City.
ART DESIGNERS and MANUFACTURERS.

CHOICE FURNITURE.
UNIQUE FRESCOES.
MOSAIC GLASS.
INTERIOR WOOD-WORK

LOW'S ART TILES. Chelsea, Mass.

For Fire-Places, Hearths, Wainscoting, &c.
New York Office, **CARYL COLEMAN,** Agent, 9 East 17th St., between Broadway & 5th Ave., N.Y.

MANTELS AND GRATES.

Fine Brass Grates, Fenders, Andirons, Fire Sets, etc.
General Agent LOW'S ART TILES.
FLOOR AND ORNAMENTAL TILE,
For Halls, Vestibules, Conservatories, Hotels, Banks, etc. Tile Facings and Hearths.
ORNAMENTAL METAL WORK.
Stable Fittings, Weather-Vanes, Crestings, Fountains, Vases, Drinking-Fountains, Chairs, Settees.
HENRY DIBBLEE, 266 & 268 Wabash Ave., Chicago.

ARTISTIC TILES

FOR WALLS, FIRE-PLACES AND FLOORS
OF PUBLIC BUILDINGS AND PRIVATE RESIDENCES. Manufactured by
The International Tile Co., (Limited.)
New York Office and Show Rooms:
8 East 17th Sreet.
Works, Third St., between Hoyt and Bond Sts.,

ESTERBROOK'S STEEL PENS

FOR SALE BY ALL STATIONERS.
THE ESTERBROOK STEEL PEN CO.
20 John Street, New York, N. Y.

Potter's Mortar Material.

For laying Front Brick, Chimneys and Fireplaces **it has no Equal.**

FURNISHED IN RED, BLACK, OR GRAY. Send for Circulars.

AMERICAN SOAPSTONE FINISH CO., Providence, R. I.

P. O. BOX 35.

Annunciators, Electric.

EDWARDS & COMPANY,
(PATENT)
Electric Bells and Annunciators,
AUTOMATIC BURGLAR ALARMS, FIRE ALARMS, Etc.
Estimates for Electric Bells, Annunciators, Speaking-Tubes, Letter-Boxes, Door-Openers for Apartment-Houses, etc.
GAS-LIGHTING BY ELECTRICITY.
Factory: 4th Ave. and 144th St. Office: 41 Beaver St. N. Y.

Elevators and Hoisting Machinery.

STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.
CLEM & MORSE,
Manufacturers and Builders of
Hydraulic, Steam, Belt and Hand-Power Passenger and Freight Elevators, Dumb-Waiters, Automatic Hatch-Doors, etc.
Sole owners of the right to apply the Heebner Patent Governor to Elevators and Hoisting Machinery. *Send for Illustrated Circular.*
Nos. 411 and 413 Cherry Street, Philadelphia, Pa.
Branch Office, 108 Liberty St., New York.

Architectural Iron-Work.

T. H. BROOKS,
ARCHITECTURAL IRON-WORK,
ORNAMENTAL DIRECT RADIATORS,
IMPROVED INDIRECT RADIATORS
Cleveland, Ohio.

Fireplaces, Ash-Traps, and Grates.

EUREKA GRATE WORKS,
Manufacturers of
PATENT FIREPLACE LININGS,
Patent Self-closing Ash-Traps,
Grates of all kinds,
Iron Mantels, and Importers of Tiles.
CINCINNATI. OHIO.

Architectural Iron and Jail Works.

Architectural Iron and Jail Works.
IRON STORE-FRONTS, COLUMNS AND GIRDERS,
Iron Railings and Verandas,
BANK VAULTS, FIRE-PROOF DOORS & SHUTTERS,
JAIL CELLS AND CAGES,
and all kinds of iron-work required in the erection of buildings.
M. CLEMENTS,
Catalogues furnished on application. Cincinnati, Ohio

Inlaid Floors and Borders, Ceilings, Wainscotings, Mantels, Sideboards, Bookcases, Counters, etc.

W. E. WHEELER,
Successor to R. M. Hubbard & Co.
Established 1874.
Manufacturer of Hubbard's Patent
Inlaid Floors and Border.
The most beautiful and durable floor made. Hundreds of them in the finest houses in the country. Illustrated Catalogue sent free. Fine dwelling, office, and hotel interiors and Art Furniture from special designs. Drawings and estimates furnished on application.
84 to 96 Erie Street, Toledo, Ohio.

Architectural Sheet-Metal Work.

G. L. Swett & Company,
Manuf'rs of Plain and Ornamental
SHEET-METAL WORK FOR BUILDINGS.
Copper Gutters, Cornices, Windows, Finials, Galvanized-Iron Ventilators, Roofing, etc.
IMPROVED METALLIC SKYLIGHTS.
N. B.—We warrant our Skylights to be Fire and Storm-Proof. They are the best made and are in use by the Heliotype Printing Co., Notman Photographic Co., U. S. Sub-Treasury and Post-Office, and nearly all the principal buildings in Boston.
295 Harrison Ave., cor. Motte St., Boston.

Iron Structures.

BOSTON BRIDGE WORKS,
D. H. ANDREWS, Engineer.
Office, ... 13 Pemberton Square Boston.
WROUGHT IRON TRUSSES,
BOX AND PLATE GIRDERS & BEAMS
For sustaining roofs, floors, walls, and other loads of all kinds, designed and built. Our long experience embraces the designing and construction of many wrought-iron structures, large and small, a conspicuous example of which may be examined in the wrought-iron trusses for roofs and floors of the Exhibition Building of the N. E. Manufacturers' and Mechanics' Institute, Boston.

Cement, Portland.

BROOKS, SHOOBRIDGE & CO.
Best English Portland Cement.
Works: Grays, Essex, England.
New York Office: No. 7 Bowling Green.
Also Roman Cements, Fire-Brick, Felt, etc.

Peerless Colors for Mortar.

PEERLESS COLORS FOR MORTAR,
BLACK, BROWN, BUFF, RED.
Brightest and Most Durable Colors Manufactured.
Send for Circular.
SAMUEL H. FRENCH & CO.,
York Avenue and Callowhill Street, Philadelphia, Pa.

Decorative Glass by Sand Blast.

JOHN MATTHEWS,
First Avenue, Twenty-sixth and Twenty-seventh Streets, NEW YORK.
Sole licensee in New York of the Tilghman Sand Blast.
Decorative Glass from Late Designs Executed by Sand Blast or Embossing Processes in a Superior Manner.
SHEET AND PLATE GLASS GROUND TO ORDER
Send for Illustrated Catalogue or Estimates

Steam Heating.

Page Steam Heater.
The Cheapest, Most Economical and Efficient Heater in the Market.
SPECIFICATIONS AND ESTIMATES FURNISHED.
Send for Circulars.
PAGE STEAM HEATING COMPANY,
NORWICH, CONN.

THE TAHANTO MANUFACTURING COMPANY,
Manufacturers of Decorative Articles in Metal.

Friezes, Panels, Mantel-Facings, Bas-Reliefs, &c., from Original Designs or those furnished, for the interior Decoration of Dwelling-Houses, Public Buildings, Hotels, Elevator-Cabs, Parlor and Passenger Cars, Steamers, &c., in Copper, Brass, Bronze, and Silver, reproducing with exact fidelity natural objects or other models.

Special attention is called to the reproductions from natural leaves and flowers in the panels and tiles for furniture and interiors.

☞ Correspondence solicited and estimates furnished on application.

42 Batterymarch Street, Boston.

E. V. R. THAYER, President. S. L. HOLDREGE, Treasurer.

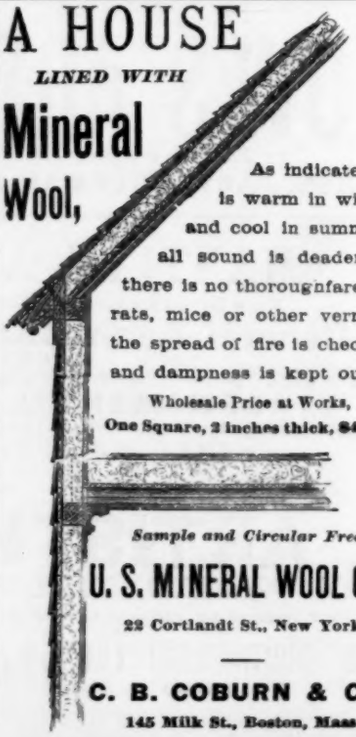
ROSENBERG'S
ARCHITECTURAL FINISH, AND OIL SHELLAC.
For Sale in Boston by WADSWORTH, HOWLAND & CO.
STANDARD VARNISH WORKS, D. ROSENBERG & SONS, Man'f's., 734-740 E 14th St., N. Y.

CLOTH COVERS,

Sent by mail on receipt of price, $1.00.

JAMES R. OSGOOD & CO., 211 Tremont Street, Boston.

A HOUSE
LINED WITH
Mineral Wool,



As indicated, is warm in winter and cool in summer; all sound is deadened; there is no thoroughfare for rats, mice or other vermin; the spread of fire is checked and dampness is kept out.

Wholesale Price at Works, One Square, 2 inches thick, $4.00.

Sample and Circular Free.

U. S. MINERAL WOOL CO.,
22 Cortlandt St., New York.

C. B. COBURN & CO.,
145 Milk St., Boston, Mass.

Elevators.

Z. WILE,
PASSENGER AND FREIGHT ELEVATORS,
Hand-Hoists, etc., of the latest improved inventions now manufactured. Invalid Elevators a specialty.
Office, 191 Tremont Street, Boston.

LOUISVILLE
MACHINE AND ELEVATOR WORKS,
SULZER & VOGT, Proprietors,
Manufacturers and Dealers in all kinds of
ELEVATORS,
Nos. 717 to 731 East Main St.,
Between Clay and Shelby, LOUISVILLE, KY.

HYDRAULIC STEAM AND BELT ELEVATORS.
Hand-Hoists operated with ropes or cranks. Automatic Hatch-doors. Governors, and Safety-catches.
GEO. C. HOWARD.
Works, 1763 Barker Street, Philadelphia, Pa
New York Office, 12 Cortlandt Street.

Established 1835.
E. E. McCALVEY,
Manufacturer and Builder of the latest improved
Steam, Belt, and Hand-Power
Passenger & Freight Elevators.
Automatic Hatch-Doors. Also, Invalid Safety-Elevators, and Dumb Waiters for Hotels and Residences. Send for Illustrated Circular.
602 Cherry St., Philadelphia, Pa.

United States Mutual ACCIDENT Association, 320 Broadway, N. Y.

To Architects and Builders. Save one-half the usual cost of Accident Insurance by insuring in the United States Mutual Accident Association, 320 and 322 Broadway, New York. The oldest, largest, strongest and surest Mutual Accident Association in the World. Insures against accidents at half the rates of stock companies. Architects or Draughtsmen, having office duties only, can receive $10,000 insurance with $50 weekly indemnity at a cost of about $25 per annum, or half that amount of insurance at corresponding rates. Architects or Master Builders, supervising only, may receive $4,000 insurance with $20 weekly indemnity. Annual cost, $12.
How to become a member: — Write for Circular and Application-Blank, and when received fill out your application, enclose $5 and forward it to the Secretary at New York, on receipt of which a policy will be promptly mailed to you.

Best and cheapest Copying-Press made.
GEO. A. OHL & CO., Newark, N. J.

WATER COLORS
G. Wagner's Celebrated Specialty, for Architects and Designers. Send for Price-List to
J. MARSCHING & CO., 27 Park Place, N. Y.

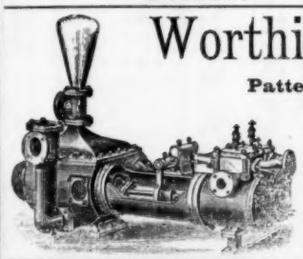
TWO MONTHS FREE
New Subscribers who pay their Subscription ($6.00) for 1885, in full, before December 25, 1884, will receive, gratis, the nine issues for Nov. and Dec. 1884.

WIRE LATHING,
ESPECIALLY ADAPTED TO
Public Buildings, Private Residences, Mills, Warehouses, Stores, and all Mercantile Structures.
IT IS POSITIVELY FIRE-PROOF.
WIRE LATHING possesses the following qualities:
IT IS NOT COSTLY.
IT IS EASILY AND CHEAPLY APPLIED.
PLASTERING ON THE WIRE LATH WILL NOT CRACK.
THE LATH WILL NOT CORRODE.
The plastering, when applied, clinches on both sides of the wire, forming a double surface.
THE WIRE LATHING is extensively used by the United States Government in its Custom House Court House, and Post Office Buildings.
It is indorsed by the leading Insurance Companies, who have applied it to their own fine edifices.
Full information given on application to the
CLINTON WIRE CLOTH CO., Clinton, Mass.
68 Beekman Street, New York. 148 Lake Street, Chicago.

SHINGLE STAINS
Much Preferred to
LINSEED OIL AND CHEAPER ALSO.
S. CABOT, Jr. 70 KILBY ST.
BOSTON
Send for circulars.

ATLANTIC
White Lead and Linseed Oil.
ROBERT COLGATE & CO.,
GENERAL AGENTS,
287 Pearl Street, New York.

BURDITT & WILLIAMS,
20 Dock Square,
BOSTON.
Unequalled Stock of Choice Hardware. Specifications figured and orders filled in all markets.



Worthington Steam Pumps.
Patterns specially adapted to
HOUSE TANK SERVICE
And Hydraulic Elevators.
ABSOLUTELY NOISELESS.
HENRY R. WORTHINGTON - New York.
BOSTON, CHICAGO, ST. LOUIS, CINCINNATI, CLEVELAND, SAN FRANCISCO, PITTSBURGH.

HANOVER FIRE INSURANCE CO.

Cash Capital	$1,000,000.00
Reserve for Re-insurance	625,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK. — ₱ M.	New York. (Wholesale Prices.)	Boston.	Chicago. (Prices to Builders and Contractors.)	Philadelphia.
Common: *Cargo afloat.*				
Pale	$2 50 @ $3 50	Eastern 7 50 @ 8 00	Building Brick 6 50 @ 7 50	Hard 8 00 @ 8 50
Jersey	4 50 @ 5 25	Bay State Hard 9 00		Salmon 5 00 @ 6 00
Up River	5 00 @ 5 50	Domestic Com. 8 00 @ 9 00	Indiana Pressed 16 00 @ 28 00	Stretchers 11 00 @ 14 00
Haverstraw Bay	5 50 @ 6 00	Domestic Face 19 00 @ 20 00	St. Louis Fronts 25 00 @ 30 00	Pressed 20 00 @ 24 00
" 1st	6 00 @ 6 50	Philadelphia 40 00 @ 45 00		
Fronts:		Phila. mould 50 00 @ 80 00		
Croton, Brown	13 @ 14 00		22 00 @ 35 00	
" dark	14 @ 15 00		65 00 @ 350 00	
" red	14 @ 15 00		50 00 @	
Chicago pressed				
Chicago Moulded				
Baltimore	37 @ 41 00	Glens Falls 25 00 @ 26 00		
Glens Falls — white	30 @ 35 00		42 00 @	
Philadelphia	@ 27 00		40 00 @	
Trenton	@ 27 00		25 00 @	
Milwaukee		Glens Falls Mould. 30 00 @ 35 00	60 00 @ 100 00	
Moulded:			30 @	
Clark's Glens Falls — Red	25 00 @ 27 00		35 @	
" — White	30 00 @ 35 00	35 00 @ 40 00	55 00 @ 65 00	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00		
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 75
Enamelled (edge and end)	90 00 @ 115 00	@	@ 125 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wisconsin "			80 @ 90	
Rosendale Cement	80 @ 1 00	@ 1 50	*Not Sold.*	1 25 @ 1 65
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	2 75 @ 3 00	2 30 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 70 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Selenitic		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	@ 7 50	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 1 00	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 20	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	95 @ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	21 @ 23	@ 30	30 @ 35	24 @ 30
" (Goat)	30 @ 35	@ 30	35 @ 40	@
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	75 @ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine	@		80 @ 90	

(Continued on page vi.

10

FOR A SASH OF 250 LBS.

"MORTON'S METAL"

(Registered Trade-mark, May 1st, 1883.)

Cable and Champion Sash-Chains

and Patented Attachments.

The most **RELIABLE** and **CHEAPEST** article in the market for suspending

Window-Sashes.

HAS GREAT TENSILE STRENGTH,

Can be easily applied to any window, and gives SATISFACTION wherever used. Samples sent to any ARCHITECT free on application. Now in use in all the leading cities throughout the United States.

MANUFACTURED ONLY BY

THOMAS MORTON,

65 ELIZABETH ST., NEW YORK.

CHAMPION CHAIN.

BUILDING MATERIALS.

	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia (Prices to Builders and Contractors.)
Foundation:				
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone.				
Longmeadow		75 @ 85		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	
Amherst	1 00 @	90 @ 1 00	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	70 @ 90
Berlin	75 @ 1 00	80 @ 90	55 @ 55	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble:				
Lee, Mass	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	1 50 @ 2 50
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	— @ —
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	
Slate: Roofing (℔ *square*)	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	@ 7 00
" green	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" purple	@ 15 00	13 00 @ 14 00	— @ 16 00	5 00 @ 5 75
" red	— @ —	Brownville, Me.	7 20 @ 7 60	5 00 @ 5 75
" black, Lehigh	— @ —	6 50 @ 9 00	7 30 @ 8 00	6 00 @ 6 25
" " Chapmans	@	Monson, Me.	*Not sold.*	@ 15 00
Tiles, Am. ℔ M.		5 50 @ 8 00		
LUMBER.—℔ M. (*Ordinary dimensions.*)				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	44 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	40 00 @ 46 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	37 00 @ 44 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Cypress	@	32 00 @ 35 00	@	@
Clapboards:				
Pine	@	33 00 @ 55 00	14 00 @ 22 00	—@—
Spruce	@	23 00 @ 30 00	*Not sold.*	—@—
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 @ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 00 @ 2 25	2 25 @	—@—
Spruce	2 15 @ 2 25	2 15 @ 2 25	*Not sold.*	2 40 @ 2 60
Shingles:				
Pine, shaved	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed	4 00 @ 5 60	@ 4 50	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood	2 10 @	@ 3 00	5 50 @ 8 00	30" $10 @ 28
Cedar, split	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress 7 x 24	18 00 @ 20 00	5 50 @ 6 00	*Not sold.*	16 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 6	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 22	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M. *First Quality, Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	
Cherry	80 00 @ 120 00	60 00 @ 90 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	45 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@ 180 00	100 00 @ 150 00	150 00 @ 180 00	100 00 @
" St. Domingo	@ 350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	50 00 @ 55 00	70 00 @ 80 00
Sycamore quartered		@ 65 00		
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood ℔ lb.	@ 6		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 100 00	80 00 @ 120 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	@ 30 00	20 00 @ 30 00
Yellow pine ℔ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil, ℔ lb.*)				
White lead, Am	5½ @ 6	5½ @ 6	5½ @ 5½	4 @ 6½
" Zinc, "	5 @ 8½	5 @ 8	7 @ 11	4 @ 8
Red, Am.	6 @ 6½	6 @ 6½	5½ @ 6	
" Venetian	6 @ 10½	7 @ 12	1½ @ 2½	4 @ 5½
" Vermilion	55 @ 60	55 @ 60 dry	50 @ 75	Am. 12 @ 16
Red Indian, Eng	12 @ 20	12 @ 20	12 @ 20	12 @ 16
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	4 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	8 @ 20	8 @ 20	9 @ 14
Green, Paris,	16 @ 20	25 @ 40	16 @ 35	14 @ 29
Black, lamp,	8 @ 12	15 @ 25	8 @ 30	12 @ 18
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	20 @ 35
Oil, linseed, (raw) (℔ gal.)	53 @ 54	54 @ 59	48 @ 49	54 @ 58
" " boiled	56 @ 57	57 @ 62	51 @ 53	57 @ 60
Turpentine	30 @ 31	35 @ 42	32 @ 34	38 @ 41
Varnish, coach	@	1 50 @ 6 00	1 25 @ 2 00	1 40 @ 4 00
Shellac	@	2 50 @ 3 00	3 25 @ 4 00	1 75 @ 3 00
Putty	2 @ 3	2 @ 4	02 @ 04	2 @ 2½
Whiting (℔ cwt.)	50 @ 90	1 @ 1½	1 @ 2	½ @ 7-10
Paris white, (Eng.,) (℔ cwt.)	30 @ 2 00	2 @ 3	2 @ 2½	1 30 @ 1 60
Litharge, Am	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7
Sienna, (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	@ 16	9 @ 14

(*Continued on page* vii.)

FISCHER-LEAF CO.

—MANUFACTURERS OF—

Marbleized-Iron and Slate Mantels, Grates, Stoves and Hollow-Ware, and dealers in

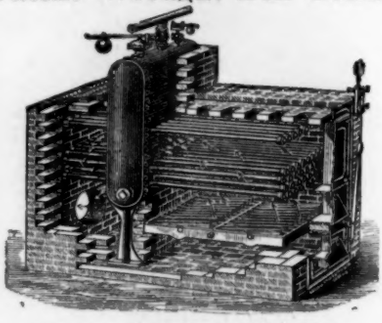
AMERICAN, ENGLISH and FRENCH TILE.

Send for Catalogue, and Prices

351 to 357 Jefferson St., Louisville, KENTUCKY.

THE HOLLAND

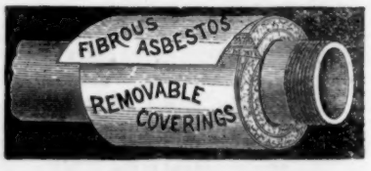
Patent Wrought-Iron Boiler



FOR STEAM HEATING.

HOLLAND & THOMPSON, - - Troy, N. Y.

PIPE-COVERING.



This covering is made entirely of Asbestos, and can not be affected injuriously by heat or dampness, nor can it be made a harbor for vermin.

Asbestos Building-Felt, Fire-Proof Cements, &c.

THE CHALMERS-SPENCE CO.,

419-421 E. 8th Street, - - NEW YORK.

SHIELDS & BROWN,

78 & 80 Lake Street, - Chicago, Ill.

MANUFACTURERS AND SOLE PROPRIETORS OF

BRADLEY'S

FOR BOILERS AND STEAM PIPES.

Reduces Condensation of Steam.

FOR GAS AND WATER PIPES.

Prevents Sweating and Freezing.

The best Non-Conductor of Heat and Cold in the World.

Send for illustrated descriptive Circular, and name this paper.

Established 1827.

W. JACKSON, & SON,

Manufacturers and Importers of

Grates, Open Fireplaces,

Fenders, Fire Irons, etc.

1166 Broadway, Bet. 27th & 28th Sts.

246 Front Street, Near Peck Slip.

New York.

Heating and Ventilation.

The GOODWIN GAS STOVE & METER CO.,
MANUFACTURERS OF
The Sun Dial Gas Cooking and Heating Stoves.

The most economical in use. Over 50 different kinds. Suitable for Families, Hotels, Restaurants and, Public Institutions. Laundry, Hatters' and Tailors' Heaters. Hot-Plates, Warming-Closets for Pantries. Hot-Water Generators, etc., etc.

1012-1016 Filbert Street, Philadelphia.

142 Chambers Street, New York.
126 Dearborn Street, Chicago.
Waldo Bros., Agts., 88 Water St., Boston, Mass.

Fire ON THE Hearth

OPEN STOVE VENTILATING CO. PURE AIR EQUAL HEAT HEALTH FIRE ON THE HEARTH

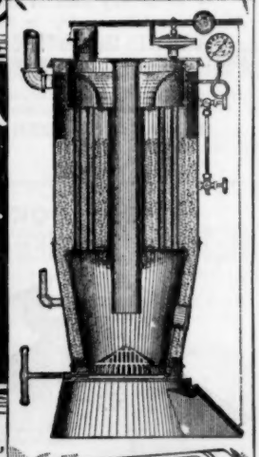
In various forms, viz: — **Air-Warming Grates, Fireplace Heaters, School-Room Heaters, Stoves, Double Heaters,** Each combining the ventilation of an open fire with the power and economy of a warm air furnace.
"Palace King Furnaces."
OPEN STOVE VENTILATING CO.,
78 Beekman St., New York.

THE PERRET PATENT
FURNACES,

For burning Coal-dust, Sawdust, &c., will save from 50 to 90 per cent in your Fuel Account
Send for descriptive Circular.

GEORGE F. GELBACH,
MANUFACTURER,
2218 to 2224 Pennsylvania Ave.,
PHILADELPHIA, PA.
Also builder of Elevators, Engines, &c.

Unparalleled Success The New AMERICAN **Automatic**



Steam Heater.

FOR DWELLINGS, PUBLIC BUILDINGS, RAILWAY STATIONS, OFFICES, &c.

Low Pressure, Self Regulating, Durable, Economical, Cheap.

UNIFORM HEAT * NO GAS * DUST, OR SMOKE * NO OBJECTIONS

Send for Illustrated Catalogue

MANUFACTURED BY

10 BARCLAY ST. NEW YORK

Newell Universal Mill Co.

DETROIT STEAM RADIATOR CO.'S Patent Cast Iron Steam Radiator.

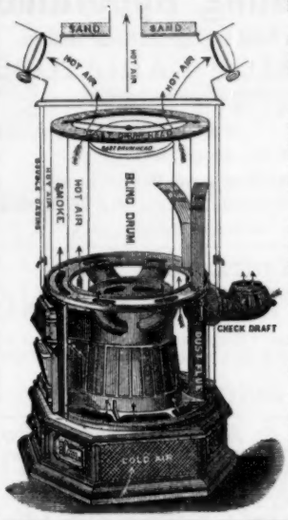
This radiator is constructed upon the principle *of a coil.* A diaphragm separates one leg of the loop from the other, so that steam entering passes up one leg to the top of the loop, down the other leg to the opposite side of the diaphragm, thence into the next loop, and so on through the Radiator, securing a PERFECT CIRCULATION and an IMMEDIATE heating of the whole Radiator. It is adapted to **High** or **Low** pressure, and surpasses all others in the **perfection** of its operation, beauty of design, and simplicity of construction. The loops or sections are made complete and independent of each other, and each loop is screwed to the adjacent loop by a double-thick wrought-iron nipple, thus forming a perfect joint not affected by contraction or expansion.

No packing is used, and there are but **two joints** in each four feet of heating surface (36-inch size), while the ordinary pipe radiator has **eight joints.** It has the largest radiating surface of any in the market to space occupied.

As each loop or section is an exact duplicate of the other, **the size of a radiator may be increased or diminished** if desired, and in case of damage by frost or otherwise, it can be easily repaired without removal from the building. This is true of no other Radiator and is very important. Being constructed without the cumbersome base so objectionable in all other radiators, there is no accumulation of **dirt and dust,** and the most perfect radiation is secured.

Liberal discount to the trade. Send for catalogue and price list. Address,

DETROIT STEAM RADIATOR CO., Office, 129 Griswold St., Detroit, Mich.



It is our purpose that everybody shall know of

THE NOVELTY FURNACE

as its economy, prolonged durability and convenience, together with the cleanliness, secured by the dust-flue, and the sand-joints preventing all possibility of the escape of dust, gas or smoke assures

ITS SUPERIORITY AS A VENTILATING APPARATUS

which is due to its original, peculiar, and superior construction and arrangement of the heating surfaces to the extent that it exposes a greater space of surface than any of its competitors, all parts of which is economically raised to an even and high temperature for a period of prolonged duration enabling it to supply a large volume of pure, warm air constantly, an evidence of

ITS IMMENSE POWER

derived from one centre drum, directly over the fire filled with reflected, surrounded by an outer drum, with an air space between, the outer drum receiving the ignited gases and products of combustion from the fire through hollow arms leading into the bottom of the drum which are made to heat thoroughly the entire surface by an inverted partition, deflecting them toward the front where they rise and pass over the partition and out, securing a result that is

APPRECIATED BY THE PEOPLE EVERYWHERE

as the following testimonial to our customers will show.

CHICAGO, MAY 27, 1884.

MR. G. WAGNER.

DEAR SIR—The No. 36 Novelty Furnace which you placed in my house last fall has given complete satisfaction, and thoroughly warmed seven rooms and a hall when the thermometer was at its very lowest, which was 23° below zero part of the winter. I cheerfully recommend it to any one wanting a perfect and economical Heater. It is entirely free from all gas and dust and easily controlled and managed. Yours respectfully, WM. BISHOP.

ABRAM COX STOVE CO., Manufacturers,
PHILADELPHIA.

BUILDING MATERIALS.

	New York.	Boston.	Chicago.	Philadelphia.
	(*Wholesale Prices.*)		(*Prices to Builders and Contractors.*)	
HARDWARE.				
Nails: (*Per Cask.*)				
Spikes, (*wrought.*)	@ 3 75		3 50 @	@ 3 50
10d. common	@ 3 50	@ 2 30	@ 2 60	@ 3 20
Shingle	@ 4 25	@ 3 35	@ 3 40	@ 3 95
Lath	@ 5 75	@ 4 55	@ 5 55	@ 4 70
(*Finishing nails according to size.*)			Add $1 50	Add 1 00 pr cask
(*For casing nails add 75c. per keg.*)				
Butts: 4"x 4" ..... (₱ doz. pairs.)				
Plain	@ 1 50	@ 1 20	65 @ 1 00	@ 1 30
Japanned	@@ 2 50	@@ 1 75	*Not sold.*	@@ 1 75
Acorn, Japanned	@@ 2 50	@@ 2 50	2 00 @ 3 75	@@ 2 00
Acorn, Boston finish ... (₱ pair.)	@@ 75	@@ 75	*Not sold.*	@@ 65
Bronze metal	@@ 2 00	plain 2 25	2 00 @ 3 25	@@ 1 75
Brass (for cupboards)	@ 15	@ 10	@ 12	@ 15
Knobs: (₱ *Set.*)				
Mineral, best	@ 15	@ 10	8 @ 10	@ 10
Lava	@@ 50	@@ 75	65 @ 80	@@ 1 00
Hematite	@@	@@ 38	31 @ 40	@@ 27
Porcelain	@@ 40	@@ 12	25 @ 30	@@ 30
Glass, solid	@@	@@ 75	*Not sold.*	*Not sold.*
Glass, silvered	@@ 1 75	88 @ 1 50	@ 1 50	@ 1 75
Bronze metal	1 00 @@ 4 00	88 @ 2 00	75 @ 2 50	90 @@ 3 00
Brass	1 50 @ 3 00	88 @ 2 00	1 50 @ 3 00	@ 1 25
PLUMBERS' SUPPLIES.				
(*Subject to inaccessible discounts.*)				
Pipe: (*Per Foot.*)				
Cast-iron, 4", d'ble thick 5 ft. length	4 05 @	@ 75	75 @ } 40%	@ 75
Cast Iron, 2" d'ble thick 5 ft. length	2 05 @	@ 35	35 @ }	@ 35
Cast Iron 4" single thick	3 04 @	@ 36	36 @ }	@ 36
" 2" " "	1 05 @	@ 24	24 @ }	@ 24
Wrought-iron, plain, 2"	46 @	@ 26	46 @ }	@ 46
" " 1"	19 @	@ 8	19 @ }	@ 19
" " ¾"	11 @	@ 4½	11 @ }	@ 11
" enamelled 2"	64 @	@ ⌊⌋ 64	24 @ }	
" " 1"	28 @	@ ▭ 20	28 @ } 70%	
" " ¾"	15 @	@ 11	25 @ }	
Galvanized-iron, 2"	64 @	@ 30	64 @ }	@ 64
" 1"	28 @	@ 10½	28 @ }	@ 28
" ¾"	15 @	@ 06	15 @ }	@ 15
Brass, drawn, 1"	30 @	@ 25	70 @ } 25%	
" " ¾"	25 @	@ 30	75 @ }	
" " ½"		@ 45	75 @ }	
Lead: (*Per lb.*)				
Pipe } 10%	6¼ @	@ 5½	6¼ @	6¼ @
Sheet }	7¼ @	@ 6½	7¼ @	7¼ @
Traps, 8 4" ..... each	1 90 @		1 90 @	1 90 @
" 8 2" ..... "	1 10 @		1 10 @	1 10 @
" ½ 8 4" ..... "	1 55 @		1 55 @	1 55 @
Bath Tubs:				
(*Tinned and Planished.*)				
Copper, 16 oz. 6 ft } 30%	19 75 @	@ 19 75	19 75 } @ 25 %	@ 19 75
" 14 oz. " }	17 75 @	@ 17 75	17 85 }	@ 17 75
Bath Boilers: (100 *lbs. pressure.*)				
Copper, 16 oz., 40 gals } 30%	28 00 @	30 gals @ 18 00	24 00 @ 20 %	@ 34 00
" 14 " 40 " }	32 00 @	40 " @ 21 00	24 00 @ 55 %	@ 32 00
Galvanized-iron, 40 gals. 55%	24 00 @		24 00 @ 55 %	@ 24 00
Solder:		16 00 @ 17 00	13 00 @ 15 %	
Iron:				
I-Beams up to 12"	@ 4	3½ @ 4	@ 4	} 30' 3½
I-Beams above 12"	@ 4	3½ @ 4	@ 4	
Channel-Beams up to 12"	@ 4 2-10	3½ @ 4	@ 4	

GLOBE VENTILATORS & CHIMNEY CAPS.

Public and Private Buildings and Railroad Cars Perfectly Ventilated.

SMOKY CHIMNEYS CURED!

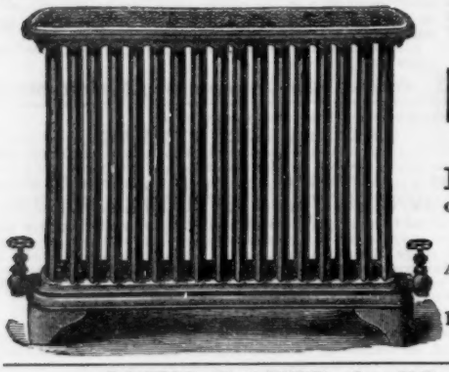
STATIONARY, ORNAMENTAL, NOISELESS, STORM-PROOF, DURABLE, SIMPLE, and CHEAP.

Send for Price-List. Working Model sent on receipt of 20 cents, to pay postage. Manufactured and for sale by

GLOBE VENTILATOR CO.

Office: 203 River Street, Troy, N. Y.

Wholesale Agents for Albany and vicinity, Hoy & Co., Nos. 25 and 27 Green St., Albany, N.Y.
Wholesale Agents for New York City and vicinity, George H. Moseman, 28 Cliff St., New York City.
Wholesale Agents for Philadelphia, Pa., and vicinity, Merchant & Co., 325 Arch St., Phila.
Wholesale Agents for Nebraska, Idaho, Montana, and Wyoming, Milton Rogers & Son, Omaha, Neb.
Wholesale Agents for Milwaukee & Vicinity, Rundle, Spence & Co., 89 West Water St., Milwaukee, Wis.
Wholesale Agents for Boston, Mass., and vicinity, Chas. M. Bromwich, 613 Broadway, South Boston.
Wholesale Agents for Chicago, Ill., Sargent, Greenleaf & Brooks, 43 and 45 Franklin St.
Wholesale Agents for Louisville, Ky., George L. Smith, 167 First St., Louisville, Ky.
Wholesale Agents for Canada, Hughes & Stephenson, 745 Craig St., Montreal, Can.
Wholesale Agents for St. Louis and vicinity, N. O. Nelson & Co., Eighth and St. Charles Sts.
Wholesale Agents for Ogden, Utah, and vicinity, D. D. Jones, Main St., Ogden, Utah.
Wholesale Agents for Rochester and vicinity, Trotter, Geddes & Co., 29 Exchange and 10 Aqueduct Sts., Rochester, N. Y.
Wholesale Agents for Minnesota, Wilson & Rogers, 24 East Third St., St. Paul, Minn. Wholesale Agents for Cincinnati and vicinity, H. McCollum & Co., 262 Race St., Cincinnati, O.
Wholesale Agents for Baltimore, Md., Lyon, Conklin & Co., 27 and 29 Light Street, Baltimore, Md.
Wholesale Agents for Detroit, Mich., and vicinity, Dry-Dock Sheet-Metal Works, cor. Orleans and Franklin Sts., Detroit, Mich.



THE H. B. SMITH COMPANY,

MANUFACTURERS OF

Heating Apparatus,

For Public Buildings and Private Dwellings.

REED'S RADIATORS,

Gold's Patent Sectional Boilers.

Gold's Pin Indirect Radiators.

Mill's Sectional Safety Boilers.

A. MERCER, Engineer.

Office and Warerooms,
137 Centre Street, NEW YORK.

Foundry, Westfield, Mass.

JOHN DAVIS & CO., Contractors for
STEAM HEATING & VENTILATING

For Stores, Hospitals, Factories and all Public Buildings. Estimates and specifications furnished for direct and indirect heat. Boilers of superior quality and design; also Steam Pumps, Iron Pipe and Fittings. Call or address

71 to 75 Michigan Street, CHICAGO.

SLATE MANTELS

Of the latest and most beautiful designs, and all other Slate and Soapstone work on hand or made to order. Joseph S. Miller & Brother, 1210 Ridge Avenue, Philadelphia, Pa. Successor to Wilson & Miller.
Send for Illustrated Price-List.

W. H. Harrison & Bro.
Manufacturers.
PLAIN AND ARTISTIC
GRATES
AND FIREPLACES
A SPECIALTY.
Also **Furnaces and Ranges.**
Send for Illustrated Catalogue. 1435 Chestnut St., Philadelphia.

PETER BACKUS,
Steam Heating Apparatus,
For Public or Private Buildings.
Sole New York Depot For the Sale of the
Albany Steam Trap Co.'s Specialties.
133 & 135 W. 25th St., New York.
(Bet. 6th & 7th Aves.)

WARM-AIR
REGISTERS.
THE TUTTLE & BAILEY M'F'G CO., 83 Beekman St., New York. 64 Union St., Boston.

IMPERIAL
GAS MACHINE.
DENNY BROS. & CO.,
34 Park Place, New York.
In use throughout the world. Send for descriptive pamphlet.

The Great Church LIGHT.

FRINK'S Patent Reflectors give the **Most Powerful**, the **Softest**, **Cheapest** and the **Best** Light known for Churches, Stores, Show Windows, Parlors, Banks, Offices, Picture Galleries, Theatres, Depots, etc. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade.
I. P. FRINK, 551 Pearl St., N.Y.

Smith & Anthony Stove Co.,

HUB FRANKLIN
Open Stove
MADE FROM ORIGINAL DESIGNS MODELED IN CLAY.
HAS DOUBLE WALLS
THROUGH WHICH
THE AIR IS DRAWN AND HEATED.
THUS SECURING IMPORTANT SANITARY RESULTS.
MADE IN 3 SIZES.
SEND FOR SPECIAL CIRCULAR & ART CARDS.

52 AND 54 UNION STREET, BOSTON.

Pardessus' Exhaust Ventilating Sky-Lights

DOME, HIPPED, And dual styles, METAL OR WOOD FRAMES.

DOME EXHAUST VENTILATOR CAP.

Natural Heat only relied upon, no foul Air, no Smoky Chimney with these caps in use. Cheap and most effective.

DOUBLE PASSAGE, QUICK FIRE REACH, AND PRACTICAL FIRE-ESCAPE.

Absolute safety to occupants of lofty buildings, in rescuing Invalids, the feeble and timid, as well as the able, without harm.

No danger from smoke, flame, ice, freezing or exposure.

A Descriptive Illustrated Pamphlet of each of the above sent at request.

S. J. Pardessus, Patentee
10 and 12 COLLEGE PLACE,
Bet. Barclay & Park Place,
NEW YORK.

Skylights.

SKYLIGHT LITIGATION.

Notice to Owners of Buildings and Others.

I hereby caution all persons against purchasing and using my patented inventions in skylights, as the patents thereon have been held by the U. S. Court to be good and valid in law, and that I was the original, first and sole inventor and not anticipated, (see Official Gazette, Vol. XXII, page 1710).

My patents cover Ventilating Ridge, or Ridge Ventilator, inside Base gutters, Hollow Bars with gutters, cross gutters under all joints and all combinations of the same, so important to prevent leakage, and all of which features are essential to a perfect, permanent and thoroughly effective skylight.

The *Maker*, the *Seller* and the *User* of my inventions are equal infringers, and where the maker lacks responsibility, I shall hold the user. (*Vide* U. S. Revised Statues, Sec. 4884 and 4919).

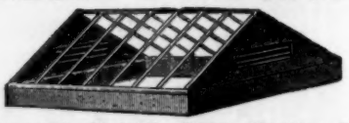
Every Skylight furnished by myself or licensees will bear my label. Only those authorized by me use my name.

Every effort is being made to bring my suits to final issue, and no pains or expense is spared to that end, which will soon be reached.

No honest man knowing the situation, would buy or use the barefaced counterfeits that are in the market, under temporary protection afforded through tardiness of the courts and bare technicalities, especially when the difference in cost is but little, if any, more than the genuine, the quality and construction which are so well known.

GEO. HAYES, Inventor and Patentee,
71 Eighth Ave. New York.

METAL SKYLIGHTS.



Warranted absolutely Storm, Weather, Fire and Condensation Proof, Free from Leakage from any source.

Skylights and Glass furnished and put up by us in any part of the country.

Ventilators and Chimney Caps for Smokey Chimneys.

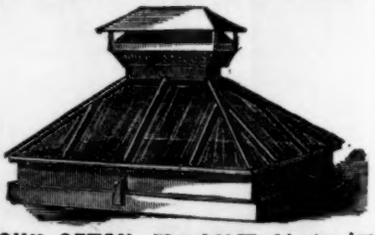
CORRUGATED IRON ROOFING AND SIDING.

GARRY PATENT IRON ROOFING AND IRON SHINGLES.

Galvanized Iron Cornices, Window Caps, Copper Gutters and Conductors.

E. VAN NOORDEN & CO.,
389 HARRISON AVE., - - BOSTON.

THE BROOKLYN
METALLIC SKYLIGHT WORKS.



JOHN SETON, 78 and 80 Washington Ave., BROOKLYN, N. Y.
☞ Send for new illustrated catalogue and price-list.

BICKELHOUPT'S
METALLIC SKYLIGHTS.

NO INFRINGEMENT on any other.

Are the Cheapest and Best.

Manufactured Solely by

BICKELHOUPT BROTHERS,
218 West 37th Street, New York.
Send for Illustrated Catalogue.

VULCANIZED RUBBER FABRICS

Of Every Description.

Rubber Belting, Packing and Hose,

ALSO

RUBBER MATS & MATTING

For Halls, Floors, Stone and Iron Stairways, etc.

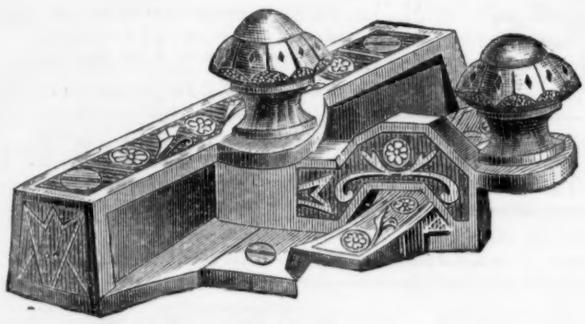
FIRE-TEST HOSE FOR BUILDINGS.

Address the Manufacturers,

NEW YORK BELTING & PACKING CO.,

Warehouse, 15 Park Row, New York.

JOHN H. CHEEVER, Treas. J. D. CHEEVER, Dept. Treas.



Full-size Cut of No. 190, Broughton's Burglar-Proof Sash-Lock.

Manhattan Hardware Co.,

READING, PA., U. S. A.

MANUFACTURERS OF

Specialties in Builders' Hardware.

BROUGHTON'S

Burglar-Proof Sash-Locks,

Patented, Oct. 8, 1879.

No.	Price per doz.	No.	Price per doz.	No.		Price per doz.	No.		Price per doz.
1	$.40	20	$.85	45	Nickel	$2.50	155	Real Bronze	$8.00
2	.50	25	.90	50	"	3.00	165	" "	8.50
6	.60	30	.95	55	Brass	6.00	175	" "	9.00
7	.70	35	1.00	65	"	6.50	190	" "	10.00
10	.75	40	2.00	75	"	7.00			

Trade discount, 33⅓%.

E. A. HITCHCOCK, President. GEORGE F. NEALE, Manager. C. W. BARNES, Treasurer.

CRYSTAL PLATE-GLASS CO.,

MANUFACTURERS OF

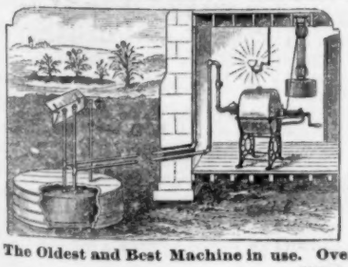
POLISHED PLATE-GLASS

SKYLIGHT-GLASS, FLOORING-GLASS,

ST. LOUIS, MO.

ESTIMATES PROMPTLY FURNISHED.

The Combination Gas-Machine Co.



DETROIT, MICH., and WINDSOR, ONT.,
MANUFACTURE

Gas-Machines

—FOR—

Lighting Churches, Hotels, Residences, Stores,

Or any place wanting artificial light.

The Oldest and Best Machine in use. Over 4,000 Machines in successful operation. Send for Illustrated Catalogue.

TIRRILL'S EQUALIZING GAS MACHINE.

Makes Standard, Uniform Gas, wirhout Fire, Danger, Smoke or Smell, using plain Bat-wing Burners.

The only Machine in the world that can reliably do it. Send for circulars, and see who endorses this statement.

TIRRILL GAS MACHINE CO.

39 Dey St., N. Y.

Boynton Furnace Co. 94 Beekman St., N. Y.

MANUFACTURERS OF
BOYNTON'S LATEST PATTERN FURNACES, RANGES, AND HEATERS. (40 YEARS EXPERIENCE.)

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY.

This school offers a four years' scientific and professional training for Chemists, Metallurgists Civil, Mechanical and Mining Engineers, Architects, Teachers of Science and Manufacturers.

THE COURSE IN ARCHITECTURE

Embraces, besides the necessary scientific and mathematical studies, the study of architectural history, and the constant practice of original design.

Special students in Architecture are received into a two years' special course.

F. A. Walker, Pres't. Prof. R. H. Richards, Sec.

CORNELL UNIVERSITY
DEPARTMENT OF
Architecture,
Civil Engineering,
Mechanic Arts.

The course in Architecture embraces the necessary scientific and mathematical studies, the history of the art, and constant practice in drawing and designing.

Persons 21 years of age, properly qualified, are received as special students, without the usual entrance examinations. For copies of the Register, giving full information, address the

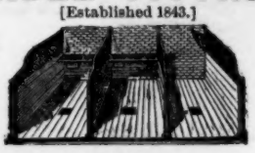
TREASURER OF CORNELL UNIVERSITY, ITHACA N. Y.

SUPERIOR
COPPER WEATHER VANES.
Gilded with Pure Gold.

THOS. W. JONES, 170-172 Front St., Near Malden Lane, NEW YORK. Successor to Chas. C. Briggs. Successor to V. W. Baldwin.

Vanes made from any drawing or design on short notice. Illustrated Catalogue of over 200 designs mailed to any address. Mention this paper.

THE LARGEST MANUFACTURERS IN THE UNITED STATES
—OF—
STABLE FITTINGS.
[Established 1843.]



HAY RACKS, MANGERS, ETC., ETC.
☞ Send for Prices and Catalogues.
SAMUEL S. BENT & SON,
72 Beekman St., New York.

Nantucket Scraps;
or, The Experiences of an Off-Islander, in Season and out of Season, among a Passing People. By Mrs. Jane G. Austin. 1. vol. 16mo, $1.50.

J. R. Osgood & Co., 211 Tremont St., Boston.

RICHARDSON & BOYNTON CO., 234 WATER STREET, N. Y. 84 LAKE ST., CHICAGO, ILL.

MANUFACTURERS OF FURNACES, HEATERS AND RANGES.

Fifty thousand of these popular furnaces in use. Etsablished, 1849. Same address as for twenty years past. Send for Circular.

Classified Advertisements.

[*Advertisers can be indexed only under a single head free of charge.*]

Architects' Materials. PAGE
Keuffel & Esser, New York.....xxiv
Wadsworth, Howland & Co., Boston.....iv
Annunciators.
Edwards & Co., New York.....iv
W. R. Ostrander & Co., New York.....xi
Western Electric Co., New York & Chicago.....xi
Asbestos Coverings.
H. W. Johns M'f'g Co., New York.....xvi
Asphalt.
Henry R. Bradbury, New York.....xii
New York Mastic Works.....i
Basin Waste.
H. M. Weaver, Mansfield, O.....xxi
Bell Founders.
H. McShane & Co., Baltimore.....xx
Vanduzen & Tift, Cincinnati, O.....xx
Books and Journals.
Wm. T. Comstock, New York.....ii
J. R. Osgood & Co., Boston.....xv
Brick (Ornamental).
Anderson Pressed Brick Co., Chicago.....xxii
Hydraulic Press Brick Co., St. Louis.....xxii
Peerless Brick Co., Philadelphia.....xxii
Waldo Bros., Boston.....xxii
Building Paper.
N. Y. Coal Tar Chemical Co., New York.....xii
Carpetings.
W. & J. Sloane, New York.....i
J. H. Pray, Sons & Co., Boston.....i
Cement.
James Brand, New York.....xxii
Brooks, Shoobridge & Co., New York.....iv
Howard Fleming, New York.....xii
Gabriel & Schaill, New York.....xxii
Johnson & Wilson, New York.....xxiv
Sinclair & Babson, New York, N. Y.....xxii
Standard Cement Co., Hartford, Conn.....xxii
Chair-Seating.
Baker, Pratt & Co., New York and Phila.....xi
Harwood Chair Seat Co., Boston.....xi
Clocks for Public Buildings.
E. Howard Watch & Clock Co., Boston.....xx
Seth Thomas, Thomaston, Conn.....xx
Conductors (Water).
Austin, Obdyke & Co., Philadelphia.....ii
Boston Spiral Tube Works, Boston.....ii
Solderless Standing-Seam Conductor Co., Allegheny, Pa.....ii
Contracting. Flynt Building & Construction Co., Palmer, Mass.....xii
Coppersmiths and Metal-Workers.
G. L. Swett & Co., Boston.....iv
Copying-Press.
Geo. A. Ohl, Newark, N. J.....v
Cornices (Galvanized Iron).
Meeker & Bro., St. Louis, Mo.....xix
Covering (Boiler).
Shields & Brown, Chicago.....vi
Cypress-Lumber.
A. T. Stearns Lumber Co., Boston.....xx
Decorative Leather.
Walker & Thompson, New York.....iii
C. R. Yandell & Co., New York.....i
Decorators.
Cox Sons, Buckley & Co., New York.....ii
Otto Gaertner, New York.....iii
Haskins, Chicago.....iii
L. Haberstroh & Son, Boston.....iii
J. Holmes, Boston.....iii
La Farge Decorative Art Co., New York.....iii
Donald McDonald, Boston.....i
W. J. McPherson, Boston.....iii
Frank Hill Smith, Boston.....iii
Elevators, Etc.
Clem & Morse, Philadelphia.....iv
Crane, New York & Chicago.....i
L. S. Graves & Son, Rochester, N. Y.....i
Geo. C. Howard, Phila.....v
E. E. McCalvey, Philadelphia.....v
Otis Brothers & Co., New York.....i
Stokes & Parrish, Philadelphia.....i
Sulzer & Vogt, Louisville, Ky.....v
Whittier Machine Co., Boston.....i
Z. Wile, Boston.....v
Engines (Caloric Pumping).
Delamater Iron Works, New York.....ii
Engines (Gas).
Schleicher, Schumm & Co., Philadelphia.....xii
Exhibition (Building).
H. L. Gay, Chicago.....xvi
Fencing (Iron).
David Fettit & Co Phila.....xix
Fire-Proof Building.
Fire-Proof Building Co., New York.....xxiii
Frank Lyons, Jr., New York.....xxiii
Magneso Calcite Fire-Proof Co., Boston.....xxiii
Henry Maurer, New York.....xxiii
Ottawa Tile Co., Chicago.....xxiii
Raritan Hollow and Porous Brick Co.....xxiii
John J. Schillenger, New York.....xxiii
Wicht Fire-Proofing Co., New York.....xxiii
Floors (Inlaid).
J. W. Boughton, Phila.....xi
National Wood M'f'g. Co., New York.....xxiv
Wm. Hannam & Co., New York.....xxiv
W. B. Wheeler, Toledo, O.....iv
W. C. Runyon & Co., Rochester, N. Y.....xi
Furniture.
Degraaf & Taylor, New York.....xi
Keeler & Co., Boston.....xi
Tomlinson & Carsley, Chicago.....xi
Gas-Fixtures.
Archer & Pancoast M'f'g Co., New York.....xii
Mitchell, Vance & Co., New York.....i
Oxley, Giddings & Enos, New York.....i
Gas-Machines.
Combination Gas-Machine Co., Detroit.....ix
Denny Bros. & Co., New York.....viii
Pa. Globe Gas-Light Co., Phila.....xi
Tirrill Gas-Machine Co., New York.....ix
Gas-Stoves.
Goodwin Gas-Stove Co., Phila.....vii
Glass.
Crystal Plate-Glass Co., St. Louis, Mo.....ix
Glass Roofing.
Arthur E. Rendle, New York.....i
Glass (Stained and Ornamental).
James Baker & Son, New York.....ii
Geo. R. Clarke & Co., Boston.....ii
Wm. Coulter & Son, Cincinnati.....ii
George Drake, Cleveland, O.....iii
Otto F. Falck & Co., New York.....ii
Friedericks & Staffin, Detroit, Mich.....iii
Alfred Godwin & Co., Phila.....iii
R. S. Groves & Steil, Philadelphia.....ii
H. Edgar Hartwell, New York.....iii
Kelley & Co., Boston.....iii
S. S. Marshall & Bros., Allegheny, Pa.....iii
John Matthews, New York.....iv
McCully & Miles, Chicago.....ii
W. J. McPherson, Boston.....ii
Donald MacDonald, Boston.....iii
Bedding, Baird & Co., Boston.....ii
Samuel West, Boston.....ii
W. C. Young, Phila., Pa.....ii
Grates, Etc.
J. S. Conover & Co., New York.....xxiv
Henry Dibblee, Chicago.....iii
Eureka Grate Works, Cincinnati, O.....iv
W. H. Harrison & Bro., Philadelphia.....viii
W. Jackson & Son, New York.....vi
Edwin A. Jackson & Bro., New York.....xii
Wm. H. Jackson, New York.....xxiv
Open Stove Ventilating Co., New York.....vii
Hardware.
Burditt & Williams, Boston.....v
Manhattan Hardware Co., Reading, Pa.....ix
Heating Apparatus.
Bartlett, Hayward & Co., Baltimore.....i
Boynton Furnace Co., New York.....x
Abram Cox Stove Co., Philadelphia, Pa.....vii
Geo. F. Gelbach, Phila.....vii
Richardson & Boynton Co., New York.....x
Heating Apparatus (Steam).
Peter Backus, New York.....viii
John Davis & Co., Chicago, Ill.....viii
Detroit Steam Radiator Co., Detroit, Mich..vii
A. A. Griffing Iron Co., Jersey City.....xxiv
Holland & Thompson, Troy, N. Y.....vi
Newell Universal Mill Co., New York.....vii
Page Steam-Heating Co., Norwich, Conn....iv
Rutzler & Blake, New York City.....iii
H. B. Smith Co., New York.....viii
James P. Wood & Co., Philadelphia.....i
Heating and Ventilating.
Smith & Anthony Stove Co., Boston, Mass..viii
Heliotype Process.
Heliotype Printing Company, Boston.....xi
Hinges. M. W. Robinson, New York.....xix
Hinges (Spring).
Van Wagoner & Williams Co., New York..xxiv
Insurance.
American Fire Ins. Co.....xii
Insurance (*continued*).
Hanover Fire Ins. Co.....v
Insurance Co. of North America, Phila.....xii
United States Mutual Ins. Co., New York.....v
Iron Roofing.
Cincinnati Corrugating Co., Cincinnati..xviii
Iron-Work (Architectural).
Bartlett, Hayward & Co., Baltimore.....i
Boston Bridge Works.....iv
T. H. Brooks, Cleveland.....iv
Carnegie Bros. & Co., Pittsburgh, Pa.....xix
Cheney & Hewlett, New York.....xix
M. Clemente, Cincinnati, O.....iv
Composite Iron-Works Co., New York.....xvi
Cooper, Hewitt & Co., New York.....xx
Samuel J. Creswell, Philadelphia.....xix
J. B. & J. M. Cornell, New York.....xix
J. G. & T. Dimond, New York.....xix
Manly & Coopes M'f'g Co., Phila.....xix
McIlose & Lyon, Dayton, O.....xix
John Merry, New York.....xix
Mesker & Bro., St. Louis, Mo.....xix
A. Northrop & Co., Pittsburgh, Pa.....xix
Passaic Rolling Mill Co., Paterson, N. J.....xix
Phœnix Iron Co., Philadelphia.....xix
Snead & Co., Louisville, Ky.....xix
J. S. Thorn, Phila., Pa.....xix
Union Foundry and Pullman Car Wheel Works, Chicago, Ill.....xix
Wallis Iron Works, Jersey City, N. J.....xix
W. D. Thompson, New York.....ii
Locks.
Yale & Towne M'f'g Co., Stamford, Conn.xxiv
Machinery.
Goodell & Waters, Philadelphia.....xx
Machinery (Laundry).
Troy Laundry Machinery Co., Troy.....xx
Mantels.
Henry Dibblee, Chicago.....iii
Joseph S. Miller & Bro., Philadelphia.....viii
Mantels (Slate).
Fischer-Leaf Co., Louisville, Ky.....vi
Marble Mosaics.
J. Pasquali & C. Aeschlimann, New York...iii
Stillman & Nicoll, Boston, Mass.....xi
Marble-Workers.
A. L. Fauchere & Co., New York.....ii
Robert C. Fisher, New York.....i
Metal-Work (Art).
Tahanto M'f'g Co., Boston.....iv
Metal-Workers.
J. & R. Lamb, New York.....ii
Mineral Wool.
U. S. Mineral Wool Co., New York.....iv
Mortar Black.
Henry D. Dupee, Boston.....xxii
Mortar Colors.
American Soapstone Finish Co., Providence, R. I.....iv
Samuel H. French & Co., Philadelphia.....iv
Oils.
Robert Colgate & Co., New York.....v
Pens.
The Esterbrook Steel Pen Co., New York....iii
Photographs.
J. W. Taylor, Chicago, Ill.....i
Pipe-Covering.
The Chalmers-Spence Co., New York.....vi
Pumps (Steam).
Geo. F. Blake M'f'g Co, Boston and New York.....xx
H. R. Worthington, New York and Boston..v
Radiator (Steam).
Detroit Steam-Radiator Co., Detroit, Mich....vii
Reflectors.
I. P. Frink, New York.....viii
Registers.
Tuttle & Bailey Man'f'g Co., New York and Boston.....viii
Roofing Materials.
Bodine Patent Roofing Co., Mansfield, O.xviii
Eureka Slate Co., Poultney, Vt.....xviii
Granite Roofing Co., Phila.....xviii
Merchant & Co., Phila.....xviii
N. E. Felt Roofing Co., Boston.....xviii
H. F. Watson, Erie, Pa.....xviii
Roofers.
John Farquhar's Sons.....xii
Knisely & Miller, Chicago, Ill.....xviii
Rubber Goods.
N. Y. Belting & Packing Co., New York.....ix
Rugs. H. A. Hartley & Co., Boston.....vi
Sanitary Supplies.
Myers Sanitary Depot, New York.....xxi
Sash-Chains.
Thomas Morton, New York.....vi
Smith & Egge M'f'g Co., Bridgeport, Conn.xxiv
Scenery (Theatrical).
Lafayette W. Seavey, New York.....xxiv
Schools (Architectural).
Cornell University, Ithaca, N. Y.....x
Institute of Technology, Boston.....x
Screens.
American Screen Co., Brookline, Mass.....xi
Sewer-Gas Trap.
B. P. Bower & Co., Cleveland.....xxi
Sewer Pipe.
Akron Sewer Pipe Co. Akron, O.....xxii
Shingle Stains. S. Cabot, Jr., Boston.....v
Shutters.
Clark, Bunnett & Co., New York.....xxiv
Shutter-Worker.
C. S. Kempton, New York.....xi
Skylights, Etc.
Bickelhoupt Bros., New York.....viii
G. Hayes, New York.....viii
S. J. Pardessus, New York.....viii
John Seton, Brooklyn.....viii
G. L. Swett & Co., Boston.....v
E. Van Noorden, Boston.....viii
Slate. John Crump, Phila.....xviii
T. F. & J. A. Hayden, St. Louis, Mo.....xviii
Story & Wilbur, Boston.....xviii
Soapstone Finish.
American Soapstone Finish Co., Providence, R. I.....xviii
Stable Fittings.
Samuel S. Bent & Son, New York.....x
Statuary (Bronze).
National Fine Art Foundry, New York.....xx
Stone (Building).
Hallowell Granite Co., Bedford, Ind.....xxii
M. H. St. John, New York.....xxii
Malone & Co., Cincinnati, O.....xxii
Ohio Building Stone Co., Cleveland.....i
G. P. Sherwood, New York.....xxii
Wm. Struthers & Sons, Philadelphia.....xxii
Thomlinson & Reed, Chicago.....xxii
Stop-Cock.
Thos. Kelly & Bros., Chicago, Ill.....xxi
Terra-Cotta.
Baltimore Terra-Cotta Co., Baltimore, Md.xxiii
Boston Terra-Cotta Co.....xxiii
A. T. Chur, New York.....xxiii
A. Hall Terra-Cotta Co., Perth Amboy....xxiii
Northwestern Terra-Cotta Wks., Chicago.xxiii
Indianapolis Terra-Cotta Co., Ind'polis....xxiii
H. A. Lewis, Boston.....xxiii
Perth Amboy Terra-Cotta Co.....xxiii
Young O. Wilson & Son, Baltimore, Md...xxiii
Tiles.
American Encaustic Tiling Co., New York...i
T. Aspinwall & Son, New York.....i
Alfred Boote, New York.....ix
Caryl Coleman, New York.....iii
Henry Dibblee, Chicago.....iii
International Tile Co., New York.....iii
J. G. & J. F. Low, Chelsea, Mass.....iii
Miller & Coates, New York.....i
Fernando Miranda, New York.....i
Sharpless & Watts, Philadelphia.....ii
U. S. Encaustic Tile Co., Indianapolis.....i
Transom Lifter.
F. A. Reiher & Co., Chicago.....xi
J. F. Wollensak, Chicago.....xi
Traps. Jas. Barrett, Boston.....xxi
Trees and Plants.
Parsons & Sons Co., Flushing, N. Y.....xx
Valves and Packing.
Jenkins Brothers, New York.....xii
Vanes. Thos. W. Jones, New York.....x
Washburn & Moore, Yonkers, N. Y.....xx
Vault Lights. Dauchy & Co., Chicago.....xvi
Ventilation.
Globe Ventilator Co., Troy, N. Y.....viii
Wall Paper.
C. H. George, New York.....iii
Water-Closets.
J. L. Mott Iron Works, New York.....xxi
Water Colors.
J. Marsching & Co., New York.....v
Water-Proofing.
Theodore Hunt, St. Louis, Mo.....xxiii
Wire and Iron Work.
National Wire & Iron Co., Detroit, Mich...xvi
Wire Lathing, Etc.
Clinton Wire Cloth Co., Clinton, Mass.....v
Wood Turning.
N. Y. Wood Turning Co., New York.....xi

THE DUDLEY SHUTTER-WORKER AND BURGLAR-PROOF LOCK.

See Illustrated Advertisement in Monthly Numbers, or address,
5 BEEKMAN ST., NEW YORK.

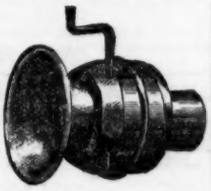
Furniture and Interior Work.

Ostrander's New Oral Annunciator.

Superior in every respect. No Batteries or Wires.

Hotels, Apartment-Houses, Residences, Offices, Factories, etc, fitted in any part of the Country. Complete Outfits of Speaking-Tubes, Whistles, Pneumatic-Bells, etc., furnished. Send for New Catalogue. Estimates furnished.

W. R. OSTRANDER & CO.,
21 and 23 Ann St., New York.

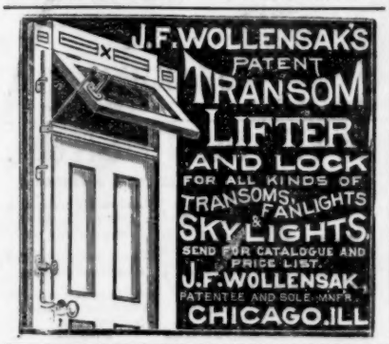


TOMLINSON & CARSLEY,
Designers and Manufacturers of
Fine Interior Finish and Furniture.
For Private Residences or Public Buildings. Estimates given on all kinds of Wood-work.
L. F. CROSBY, Designer, 55 Central Music Hall.
FACTORY, 2242 to 2256 . . - Arnold St., Chicago, Ill.

IMPROVED SEATING,
For
Schools, Churches,
Halls &
OPERA-HOUSES.

Send or Catalogue showing 20 Best Styles manufactured by
BAKER, PRATT & CO.,
19 Bond St., New York. 518 Arch St., Phila.

SETTEES AND OPERA CHAIRS.
The Newest & Best Styles for
SUNDAY SCHOOLS, CHURCHES, OPERA-HOUSES, LODGEROOMS, HALLS, OFFICES, &c.
Harwood Man'f'g. Co.,
91 Summer St., Boston.
Send for catalogue and state requirements.



Marble Mosaic Pavements,
Also Wall-Decorations in Mosaics, of either Marble, or Colored & Gold-Glass.
We employ Native Italian Artists specially trained for this work.
STILLMAN & NICOLL,
198-200 Tremont St. - Boston.

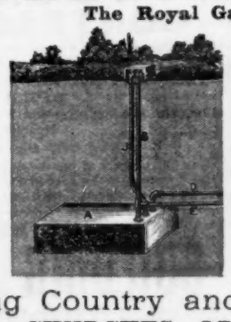
ARCHITECTS
and owners of new buildings should send for descriptive circular of this screen.
10,000 made in 2 seasons.
AMERICAN SCREEN CO.,
Brookline, Mass.

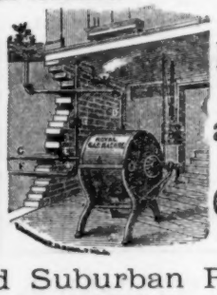
DEGRAAF & TAYLOR,
Manufacturers and Dealers
FINE FURNITURE and DECORATIONS.
47-49 WEST 14th St., and 48 WEST 15th St.
Between 5th and 6th Aves., NEW YORK.

Parquet FLOORS
All Styles of ⅞ in. thick, tongue and grooved Wood Floors in the European styles. Also
WOOD CARPET
or Ornamental Wood Floors, 5-16 inch thick for rooms of all kinds, in new and old houses. We make a specialty of these goods for **Floors, Wainscoting, Walls** and **Ceiling,** both **Plain** and **Ornamental.** We have the **largest variety, largest stock** on hand, and the **largest factory** in the U. S., as well as a large **saw mill** and **factory** in a first-class **timber** country, devoted *exclusively* to this business, and defy competition in **price** or **quality** of goods. Send stamp for book of designs and prices, and the size of your rooms for diagram & estimates
JOHN W. BOUGHTON, 1115 Market St. Phila. Pa

The Improved Royal Gas-Machine,
Manufactured by Pennsylvania Globe Gas-Light Company,
Nos. 617 and 619 ARCH STREET, PHILADELPHIA, PA.
The Royal Gas-Machine.

THE BEST, MOST DURABLE,

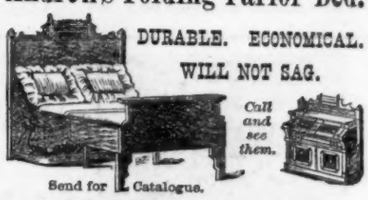




Economical and Reliable Gas-Machine.

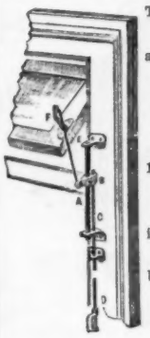
For lighting Country and Suburban Residences,
CHURCHES, OPERA-HOUSES,
Seminaries, Stores, Asylums, Hotels, Mills, Factories, etc.
All information furnished on application.

Andrews Folding Parlor Bed.



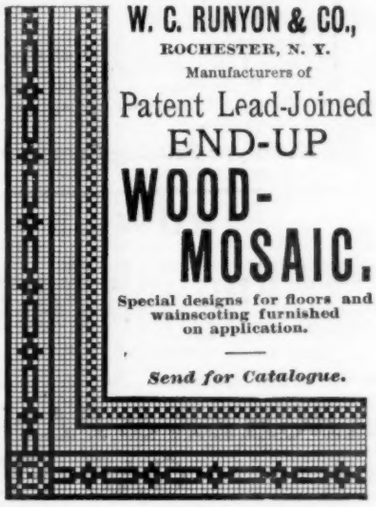
DURABLE. ECONOMICAL.
WILL NOT SAG.
Call and see them.
Send for Catalogue.
KEELER & CO.
EASTERN AGENTS,
83 to 91 Washington St., Boston, Mass.

WESTERN ELECTRIC CO.,
Chicago, Boston, New York.
Electric Call-Bells and Annunciators,
For Hotels, Residences, Offices, etc. Electric Burglar-Alarms, Electro-Mercurial Fire-Alarms. Electric Gas-lighting Apparatus. Telegraph Instruments and Supplies.



THE REIHER IMPROVED
Self-Locking Transom Lifter,
answers equally well for all transoms.
Hinged at the top.
Hinged at the bottom.
Hinged at the centre.
Exclusively manufactured by
F. A. REIHER & CO.
11 and 13 S. Canal Street,
CHICAGO, ILL.
Send for Catalogue.
Cut showing the parts belonging to the transom lifter.
A. The locking-bar.
B. The self locking adjusting block.
C. The operating rod.
D. The lower bracket.
E. The lifting arm.
F. The transverse bracket.

NEW YORK WOOD-TURNING CO.
NEW YORK CITY.
Patent Corner Blocks for Casings and Wainscoting;
Stair Builders' Supplies;
House and Picture Mouldings.
Specialty, Square Turned Work.
See illustrated advertisement in Monthly Numbers.



W. C. RUNYON & CO.,
ROCHESTER, N. Y.
Manufacturers of
Patent Lead-Joined
END-UP
WOOD-MOSAIC.
Special designs for floors and wainscoting furnished on application.
Send for Catalogue.

"Picturesque Sketches."
PRICE, $1.50.
PUBLISHED BY
JAMES R. OSGOOD & COMPANY,
211 TREMONT STREET, BOSTON, MASS.

ESTABLISHED 1836.

JOHN FARQUHAR'S SONS,

SLATE, METAL, AND COMPOSITION ROOFERS.

Nos. 20 and 22 EAST STREET, BOSTON.

Order Box, No. 83 Mechanics Exchange, No. 35 Hawley St.

Agents for Warren's Patent Natural Asphalt Roofing. Special attention given to repairs of all kinds of Roofing.

Inventors and Owners of the following Patents: *First*, Patent Fastener for securing Slates or other covering to iron Purlines where the roof is wholly of iron. *Second*, A Roof composed of Wooden Rafters encased in Asbestos, Sheet Metal, or other fire-proof material, to which Iron Purlines are fastened, and the slates or other coverings secured by our Patent Fastener. The slates are then rendered underside with hair mortar or any other material. The object intended being a Light Fire-proof Roof, avoiding all condensation and prevent[illegible] leakage.

THE

NEUCHATEL ASPHALTE CO.,

Sole Proprietors of the

Val de Travers Rock Asphalte Mines,

Canton de Neuchatel, Switzerland.

Val de Travers Rock Asphalte,

For Floors, Sidewalks, Roofs, &c.,

Durable, Fireproof, and Impervious.

For estimates and full particulars apply to office, No. 54 Astor House, New York,

HENRY R. BRADBURY, Manager.

EDWIN A. JACKSON & BRO.,

77 Beekman Street, NEW YORK.

Heat-Saving and Ventilating GRATE.

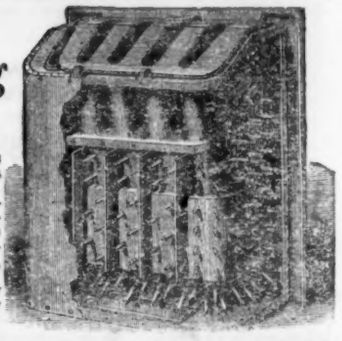
WASHINGTON, D. C., March 29, 1883.

Gentlemen :—I take pleasure in saying that the three ventilating grates of your make, which I have had in use the past winter, have given perfect satisfaction.

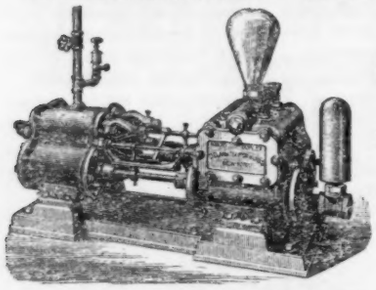
They have fully met your recommendation and come up to my expectations. They keep the rooms in which I use them, supplied with a full supply of fresh air, creating a complete ventilation. This air being heated as it passes through the air chamber, pours into the room through the perforations at the top of the grate, bringing a supply of heat which, I think, more than doubles the radiating power of the fire itself.

The one whose operation I have observed personally most closely is in my study, a room about 18 x 28 ft. in dimensions, which it keeps thoroughly warm and well ventilated.

Yours truly, STANLEY MATTHEWS



DELAMATER DUPLEX STEAM-PUMPS.



The most approved

STEAM PUMPS

Now on the United States' market for

Hydraulic Elevators,

House Tank Service,

Railway Water Stations, etc.

Water-Works Pumping Engines.

SEND FOR CATALOGUE.

DELAMATER IRON WORKS.,

40 Dearborn St., CHICAGO.

16 CORTLANDT ST., New York.

Works, foot W. 13th St.,

Jenkins's Patent Valves

Are the acknowledged standard of the world. Have been in use since 1868, under all possible conditions, and never have failed.

Send for New Valve List.

To avoid imposition see that valves are stamped, "Jenkins Bros."

JENKINS BROS.,

71 John St., N. Y. 79 Kilby St., Boston.

HELIOTYPE.

Photo-Mechanical Printing.—For the reproduction in printer's ink, on the printing-press, of Portraits and Views from Nature and all descriptions of PHOTOGRAPHIC work.

Photo-Lithography.—For the reproduction of Artists', Architects', Engineers', Surveyors', and other Drawings from originals in black and white.

Photo-Engraving and Zinc Etching.—For the production of cuts to print with type, from originals in black and white.

Photo-Caustic Printing.—For the lithographic reproduction of photographic subjects, without redrawing.

Lithography. Of all classes.

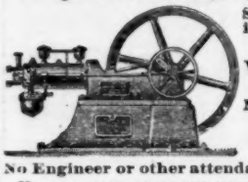
Chromo-Lithography.

Direct Transfer.—A patented process for the speedy reproduction (from originals made with ordinary ink on ordinary paper) of autograph letters, sketches, caricatures, etc., either as cuts or lithographs.

The Heliotype Printing Company, 211 Tremont Street, Boston, Mass.

NEW OTTO SILENT GAS-ENGINE.

Working without Boiler, Steam, Coal, Ashes, or Attendance.



Started by a Match it gives full power immediately.

When stopped all expense ceases.

No Explosions. No Fires or Cinders. No Gauges. No Pumps.

No Engineer or other attendant while running.

UNSURPASSED IN EVERY RESPECT for running elevators in Stores or Warehouses, pumping for hydraulic elevators, or domestic purposes, etc., etc. 1, 2, 3, 4, 7, 10, and 15 H. P. and upwards. Built by

SCHLEICHER, SCHUMM & CO.,

W cor. 33d & Walnut Sts., Philadelphia.

HOWARD FLEMING,

AGENT FOR

ROMAN CEMENT. English Portland Cement, KEENE'S CEMENT.

I supply U. S. Engineers, and the 15,000 bbls. of Portland Cement for Washington Monument.

SEND FOR CIRCULAR ON TESTS. NEW YORK OFFICE, 23 LIBERTY STREET.

American Fire Insurance Co., Phila.

CASH CAPITAL	400,000.00
Reserve and Liabilities	852,970.05
Surplus	551,548.96
Total Assets Jan. 1, 1884	1,804,519.21

ARCHER & PANCOAST MFG. CO.

GAS-FIXTURES.

NEW YORK.

BOSTON. 12 West Street.

67 Greene Street. 68, 70, 72 Wooster Street.

CHICAGO. 250-252 Wabash Ave.

Flynt Building and Construction Co.,

PALMER, MASS.

CONTRACTING.

Contracts made for furnishing all material and labor necessary to build complete

MILLS, HOTELS, CHURCHES, AND BUSINESS BLOCKS.

Also, for the construction of Railroads, Dams and Bridges.

We make Mill-Work a Specialty.

Can show some of the best Mill-Work in New England. Can give the best of references, and should be pleased to correspond with parties in any locality.

INSURANCE CO. OF NORTH AMERICA, - - of Philadelphia

Cash Capital	$3,000,000.00
Reserve for Re-Insurance	2,156,781.63
Reserve for Unadjusted Losses and other Liabilities	473,492.82
Surplus over all Liabilities	3,250,778.61

THE BEST

BUILDING PAPER.

Sackett's Water-proof Sheathing.

Strong, clean to handle, inexpensive, impervious to moisture, water and gases. Send for samples.

NEW YORK COAL TAR CHEMICAL CO.

10 Warren Street, NEW YORK.

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVI. Copyright, 1884, JAMES R. OSGOOD & Co., Boston, Mass. No. 463.

NOVEMBER 8, 1884.

Entered at the Post-Office at Boston as second-class matter.

CONTENTS.

SUMMARY: —
Plans for Reconstructing Königgratz: a Bohemian Competition. — The Smallest Water-works in this Country. — The Folly of laying-out wide Streets. — The Wooden Pavement of London: its Structure and Method of Laying. — Mr. Keely's Latest Exhibition of his Vaporic Apparatus. — The Metropolitan Railway of Paris. — "Miners' Powder." . . . 217
MR. WALTER'S ADDRESS. 219
SANITARY PLUMBING. — XXX. 219
THE ART OF CHALDEA AND ASSYRIA. — III. 221
THE ILLUSTRATIONS:
House and Stable, Milton, Mass. — Town-Hall, Hildesheim, Germany. — House, Chelsea, Mass. — House, Sheffield, Pa. — Block of Houses, Minneapolis, Minn. — View in Hamburg, Germany. — Church of the Holy Trinity, Caen, France. . . 222
AMERICAN ARCHITECT COMPETITION. — NEW SERIES. 223
NOTES FROM ABROAD. — II. 223
FOOD GALLERY OF THE HEALTH EXHIBITION, LONDON, ENGLAND. . 224
PHOTO-MECHANICAL PRINTING PROCESSES. — I. 226
QUESTIONS OF INSURANCE. 227
NOTES AND CLIPPINGS. 228

A NOVEL competition is offered to architects and engineers of all nations by the city of Königgratz in Bohemia. Königgratz is a very little city, having a population of only about six thousand, and is chiefly remarkable for its ancient fortified walls, and for having been near the scene of the battle between the Austrians and Prussians, called by all except Germans the battle of Sadowa; but it has suddenly determined to throw off its mediæval habits, and become a modern town, and to that end invites designs for levelling the old fortifications, and for laying out the site which they now cover or include, comprising an area of four hundred and sixty-eight Austrian acres, "according to all the modern experience which has been gained in architecture." The new town is to be divided into a "residential quarter and a manufacturing quarter," leaving "sufficient space for public squares and grounds." Besides the topographical plans a chart of the proposed new levels must be submitted, and in addition, a scheme for "a complete system of drainage for the lower parts of the town," and for "means of preventing inundations by the rivers Elbe and Adler." Intending competitors are cautioned that their designs must be "in accordance with the requirements of both town and country," as well as "in all respects, and especially in respect of hygiene, of the most approved modern description," and finally, must be "in accordance with the laws of Austria, and capable of being submitted for approval to the Government authority. A written explanation is to accompany each set of drawings, giving a description of the whole project, as well as "a concise statement of the best means of putting the plans into execution." For the design most approved, a premium of two thousand florins is offered, — about a thousand dollars; and second and third premiums are promised, of seven hundred and fifty and five hundred dollars, the designs in all cases to become the absolute property of the city. The plans must be deposited at the Burgomaster's office in Königgratz on or before twelve o'clock at noon on the twenty-second of December next. We do not imagine that any of our readers would think of taking part in such a contest, but the spectacle of the old episcopal walled town suddenly casting off its antiquated garments and calling aloud for clothes of the most hygienic cut, with which to frisk into the modern world, is a very curious one.

THE *Hydraulic and Sanitary Plumber* quotes from the *Contract Journal* an account of what is probably the smallest system of town water-supply on this side of the Atlantic. The community which use this system is that of Drewsville, N. H., a village of seventy-nine inhabitants, and the water is obtained from a spring in the side of a hill about half a mile off. The distributing reservoir consists of a wooden box, two feet wide, three feet long, and two feet deep, divided into one large compartment and ten small ones, which communicates with the large one by means of auger holes. The capital stock of the company owning the water-works is divided into ten shares, and each share-holder is allowed to take water from one of the small compartments for the use of his family and of those whom he allows to participate in his privilege. The system of pipes for distributing water in this way would, if the number of shareholders were larger, be somewhat complicated, but there is no great difficulty in laying ten private mains from one reservoir, and the owners obtain, in return for what seems an unnecessarily large outlay for piping, the privilege of dividing up the private supplies to any extent, without running the risk of infringing on their neighbors' rights. In practice this is done, and all the householders of the village, who are not shareholders, obtain water from one or another of the private pipes, paying a suitable rent for it. There is no other water supply available in the town, and the inhabitants must buy of the members of the corporation or go without water altogether. Fortunately, the community seems to be an amiable one, and as the houses all stand together around a little common, the cost of distribution is very moderate. The water corporation has been in existence for eighty years, and some of the pipes, consisting of bored logs, have been constantly in use during that time. Besides its pipes, the company owns a heap of dry stores, built up around the reservoir, and the wooden shed which covers it; the total investment amounting now to about three hundred dollars.

WE are glad to see in the *Builder* for the first time, so far as we can recollect, a strong and sensible protest against the unreasoning fashion, so prevalent in this country, of laying out streets, in places where land is cheap, of an absurd width, increasing in this way the cost of construction and maintenance, without securing any advantage whatever. On the contrary, it is reported on medical authority that the excessive width of the streets in certain towns in Illinois has become a source of nuisance and of positive danger to the health of persons living near them. These streets, on account of the expense of a proper pavement over so large a surface, are usually left with a simple gravel or mud surface, and are soon trodden in wet weather into a filthy paste, which diffuses in warm weather exhalations proportionate to its area, and in a dry time disintegrates into a semi-organic dust, which is blown in clouds over the neighborhood. Even in our large cities the approach to one of those expanses of filthy pavement, which we complacently call "breathing-places," is generally marked by so strong a smell of garbage and street mud as to suggest the idea that their vicinity is not always an advantage, and in less settled places the trouble is increased by the dust. No one is likely to deny that wide streets with fresh air are desirable, but wide streets exhaling the odors of acres of filth are the reverse; and it is strange that no one should have thought before of the propriety of keeping such thoroughfares, so far as the traffic will permit, in grass, restricting the roadway to the smallest practicable limit. If a street one hundred feet wide, in a city whose prosperity is a matter rather of the future, could be laid out with a fourteen foot roadway on each side next the footpath, and fifty feet of well-kept grass and shrubs between it, would be far more beautiful and dignified, as well as much cheaper, than the ordinary "avenue" of suburban towns. A good example of a street of this kind has been set in the Commonwealth Avenue in Boston, where four rows of elm trees, with grass and gravel-walks between, and a narrow roadway on each side, make up a street two hundred feet wide, and, as now planned, more than five miles long; and in the upper part of New York the abuttors on a certain wide street have united in carrying out a somewhat similar plan. There is no art so neglected in this country as that of landscape gardening, although there is perhaps no place where a knowledge of the effects to be obtained by judicious landscape engineering would be so useful as among our growing towns. It is not, we are sure, the popular appreciation of beautiful effects of foliage and line which is wanting, so much as familiarity with good examples of landscape art, even on a small scale; and the public-spirited persons, who, as members of village improvement societies, are doing so much good, would help their cause materially both by procuring and circulating such books as Downing's "Landscape Gardening," or Scott's more modern book on "Suburban Home Grounds," and by offering encouragement, in the shape of honors or small prizes, for successful efforts at carrying out the elementary principles of planning and planting.

LA Semaine des Constructeurs quotes from the "Transactions of the English Institute of Civil Engineers" some valuable statistics in regard to the wood pavements of London. As

wood has been employed in that city for paving in a great variety of ways, the account of the unsuccessful experiments is perhaps as useful as that of the successful ones. It is hardly necessary to say that, as in other cities, the wood pavement is used in London only for streets in which an unusual amount of travel is to be provided for; and out of the seventeen hundred and eighteen miles of street which the corporation surveyors have to care for, only three hundred and forty-seven are laid with a pavement of the first class, the rest having nothing better than cobblestones or macadam. Of the three hundred and forty-seven miles of well-paved streets, two hundred and eighty have granite blocks, fourteen are finished with asphalt, and fifty-three with wood. The cost of these fifty-three miles of wood pavement has amounted to about three million dollars, so that, supposing the average width of roadway to be thirty feet, the cost per yard seems to have been something over three dollars, which, considering the thoroughness with which pavements of the kind are laid in London, is very moderate.

THE ordinary foundation for the wood pavement is made of concrete, composed of one part Portland cement to five and one-quarter parts river sand, and spread about six inches thick. The grades are made as gentle as circumstances will allow, but the roadway is well drained by catch-basins and gratings at short intervals. Upon the concrete bed is laid the wood, in blocks about six inches square, with the grain vertical. Many preparations have been used for promoting the resistance and durability of the blocks, but the results indicate that the wood in its natural state is rather to be preferred to that treated in any way at present in use. Even wood saturated with creosote lasts no longer than the same without treatment, while the creosote makes the surface of the pavement black and dirty. As with us, the blocks are laid with a joint of a third of an inch or so between, but the interstices are filled with a strong mortar, of one part Portland cement to three parts sand, instead of the dry or tarred gravel filling which is used here; and each block has an iron stud inserted in the lower end before laying, which works its way into the concrete and prevents the blocks from slipping over the surface below them. Over the whole is finally spread a layer of sharp pebbles. The life of such a pavement is found by experience to be from six to eight years, and the blocks, as is shown by certain portions of Oxford Street, will sustain very heavy traffic after they have been worn down to a thickness of one and a half inches. The labor of maintenance consists mainly in sweeping and in replacing defective blocks; and the cost of all necessary work of this kind is found to be only about ten cents a yard per annum, while the average yearly cost of maintenance of a macadam road is about twenty-five cents per yard. Even with the cost of reconstruction every seven or eight years added, with interest, the total annual expense of the wood pavement during a long term amounts only to about forty-seven cents per yard, while the macadamized streets at the West End cost fifty-four cents a year for repairs alone, and Whitehall, which is a wide and short, but much frequented street, costs seventy-eight cents a year.

MR. KEELY deserves credit for his ingenuity in amusing the stockholders in his company, who sustain his experiments, and perhaps also for his success in nearly doubling the quoted price of the stock by a half-day's questionable exhibition. According to the Philadelphia *Press*, the trials made at the Government range with the air-gun have recently been supplemented by a private exhibition, given before about a dozen "gentlemen of scientific attainments" at his workshop in Philadelphia. The first experiment on this occasion was made with the generator, which we suppose is a new machine, since the first, about which so many wonderful stories were told, is said to have been sold for old iron. The generator having been raised on rollers, to show the spectators that it was empty, Mr. Keely charged it by the simple process of squirting water into it with his mouth, and then "adjusting the vibratory chord," and "giving the impulse" with a steel coil, "charged with the interatomic ether." This scientific incantation developed enough "vapor" not only to carry out the intended experiments, but to produce some unexpected effects. On connecting the generator by means of a small copper tube with a cylinder, in which moved a piston with a lever attached to the head, the pressure, as shown by a weight hung upon the lever, was found to be seventy-five hundred pounds to the square inch. On learning this, two of the "scientific gentlemen," instead of running for the nearest door, climbed up on the lever attached to the piston, with the idea that their weight would hold it down, but the great inventor merely tapped the generator, and they were thrown upward with a celerity which convinced them that they would do best not to meddle further.

THE celebrated "vapor gun" was next brought out, and bullets fired with it through thick pieces of wood. The generator was next connected, by means of a copper tube, with a small "vibratory lathe" in another room, which a second vivifying tap started off at the rate of a thousand revolutions a minute. The movement was readily controlled, although it was so rapid, at the highest speed, that a crowbar, handled, we suppose, by one of the scientific gentlemen as an instrument of investigation, failed to stop the wheel. While this experiment was in progress, and just at the moment when the motion was reversed, the top of one of the vibrators flew off, and the copper tube leading to the lathe burst with a loud report. This mishap put a sudden end to the trial of the vibrator, and dispersed the audience in all directions, but as no one found himself hurt, the scientific auditory returned, and a new exhibition, the most curious of all, was made, in which a brass ball, enclosed in glass, was made to revolve rapidly by "adjusting the chord of the vibrator," and "intensifying the vibrations" with a "cornucopia-shaped resonator." Further manipulation of the resonator resulted in accelerating or retarding at will the movement of the brass sphere.

THE Metropolitan Railway of Paris is at last in a fair way to be built, and the Minister of Public Works has already signed an agreement for the construction of the first section, extending from Puteaux to Reuilly, with a syndicate formed by the Society of Deposits and Accounts, the Industrial and Commercial Credit, the Central Popular Bank, and Mr. Forbes, the president of the London Metropolitan Railway. To this syndicate will, it is understood, be added the Northern Railway Company, whose station will be directly connected with the new line, and it is possible that other railway companies will take part. The first line is to begin at Puteaux, a popular suburb to the northwest of the city, across the Seine, and extend in a straight line toward the Arc de Triomphe, reaching the line of fortifications at the Porte Maillot, a distance of something more than two miles from the starting point. From the Porte Maillot the line runs two miles to the railway station St. Lazare, where it divides into two branches, one of which forms a loop three miles long, running to the stations of the North and East under the old "exterior boulevards," and returning by the Boulevard Sebastopol, while the other extends directly to the Lyons station, a distance of nearly four miles, and thence to Reuilly, half a mile further, to the southwest of the city. A special branch extends from the main line to Batignolles, a distance of about three-quarters of a mile. This line, although nearly fourteen miles long in all, provides only for the portion of Paris on the north of the Seine, leaving the populous southern portion as badly off as ever, but the city reserves the right to call upon the company for the construction of a second section, upon a guaranty of four per cent interest upon the capital invested in both the lines. The cost of the first section is estimated at twenty-three million dollars, and the capital of the company is fixed at ten millions. On the completion of the road sixteen trains an hour will be run from the St. Lazare station to the Boulevard Sebastopol, and eight trains from the same place to the Porte Maillot, with additional trains on the branch lines.

A NEW sort of gunpowder, known as "miners'" powder is coming into use to some extent in France. The powder differs entirely in composition and qualities from the nitroglycerine compounds, resembling ordinary gunpowder, but with the difference that chlorate of potash is used as the oxidizing agent instead of saltpetre, and carbon is supplied in an organic form. The process of preparation is very simple. A given weight of chlorate of potash is dissolved in water, and a quantity of sawdust or bran, equal in weight to the chlorate of potash, is stirred into the liquid, and the mass allowed to dry. The sawdust powder, though cheap, is less safe to prepare and handle than that made of bran, as resin, which is very likely to be present in small quantities in the sawdust, forms with chlorate of potash a compound which detonates on being suddenly disturbed. However prepared, the powder possesses, weight for weight, about twice the strength of ordinary gunpowder.

AMERICAN INSTITUTE OF ARCHITECTS.

ADDRESS OF THE PRESIDENT, THOMAS U. WALTER, AT THE ALBANY MEETING, October 22, 1884.

I HAVE the pleasure to congratulate you on the recurrence of another annual convention, which I trust will be characterized by the enthusiasm befitting the occasion.

We come together from widely separated portions of our county, bringing with us fresh thoughts in architectural design, and new developments in the sciences which underlie our art, and which naturally grow out of diversified processes of intelligent architectural practice. We are thus prepared to impart interest to our discussions, and to enlarge the sphere of professional knowledge.

Although the past year has not been distinguished in the annals of architecture, as far as it regards projects of unusual grandeur and magnitude, it is nevertheless gratifying to observe that it has been and is one of a successful and intelligent progress in art, affording unmistakable evidence of independent thought, and versatility of genius in designs.

It may also be remarked that the public taste is evidently acquiring juster views of architectural composition, and a higher appreciation of the æsthetic principles which govern art is noticeable even in some of the less pretentious buildings recently erected.

Many grander and more massive structures, dating from beginnings in previous years, have been prosecuted with vigor, developing in a high degree the genius of architecture. In some, a tasteful and noble handling of ornate features impart effects that never cease to command admiration. In others, ornamental sculpture has been made an important feature of the composition, and in most instances it has been marked with decided success.

The idea of illustrating thought and action by emblematic forms and figures, or intimating by symbolic representations the meaning of sentiments conceived in the mind, constitute some of the most important features in architectural decorations, imparting beauty to the grouping and interest to the composition.

This improved and improving condition of architecture, by which its standing as a fine art is developed, its field of design expanded, and its power to elevate and purify the public taste made manifest, is the result directly or indirectly, of the labors and influences of the American Institute of Architects, in a little more than a quarter of a century. The more we consider in connection with art achievements, the astounding progress that has been made in scientific construction, in the manipulation of the hardest materials, in heating and ventilation, in sanitary plumbing, and in a countless multitude of contrivances to promote the convenience, gratify the taste, and satisfy the proclivities of those who know how to appreciate the comforts of their surroundings, the more cause we find for satisfaction.

In architecture, as in all the learned professions, a large portion of the field is occupied by uneducated, unskilled and immature practitioners, whose only passport to the patronage of the people is the assumption of the name of *architect*.

It therefore devolves upon the Institute to prevent, as far as practicable, empiricism in architecture, by a wide dissemination of the principles which constitute it a fine art, by awakening an interest in the sciences which underlie it, and in the cognate arts which bring it into relation with the comforts and conveniences of life and the higher enjoyment of taste and propriety.

He who attempts to practise architecture without a general knowledge of the elements of nature, and of the sciences which develop their properties and their purposes, and who has never had a special training in the office of an experienced practitioner of the art, is not prepared to discharge the onerous duties of an architect, whatever may be his scholastic requirements or his mechanical skill.

Those who purpose to make architecture their life work would do well to prepare themselves for practical office study by first pursuing a course of architectural training in a technical college, embracing mathematics, line drawings to scale, mechanical drawing and linear perspective, with an exhaustive study of the nature and properties of materials.

A foundation thus laid, if well laid, would be a proper preparation for entering an architect's office as a student of the profession. He would there find ample sources of information in art, ample opportunities for practice in drawing, and for devoting himself to the acquirement of an architectural education, which, if thoroughly attained, would eventually put him in the front rank of his profession.

Having spoken of the bright outlook of our art, at the termination of another annual period of the existence of the Institute in a corporate capacity, I feel constrained to refer briefly to a species of building now in vogue that would be more honored "in the breach than in the observance."

I allude to the fact that in many of our large cities hundreds of acres of small buildings, of light and flimsy construction, unfit for residences, are now being built, in violation of the principles that govern strength, permanency, and ventilation, and affording no protection against dampness, defective drainage, and other malarious influences.

Notwithstanding the interior *make-up* of these houses is fragile and unfit for occupancy as dwellings, the exteriors are in most cases rather tastefully designed than otherwise; in many cases they are embellished with pressed and enamelled bricks in profusion, and were it not for their slighted and imperfect interiors, they might be considered as a step onward in the progress of domestic architecture.

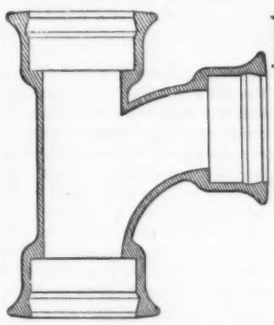
Having limited myself in this opening ceremony to little more than a congratulatory salutation on our eighteenth annual reunion, I have referred but briefly to some of the salient points of our year's work, and will now close with a few remarks on the relations of our art conjointly to ourselves, to our clients, and to the public.

While endeavoring to realize in our works a high ideal of architectural propriety and consistency, it becomes us to seek to educate the public taste to an intelligent appreciation of the beautiful in art, and to awaken juster conceptions of the elevating influences to which it is addressed.

The diffusion of knowledge in this direction would undoubtedly result in a sympathy between the architect and his client, by which a higher level of taste would be attained, and the progress of architectural science be assured.

SANITARY PLUMBING.[1]—XXX.

SIZE AND GENERAL ARRANGEMENT OF THE PIPING.



T Branch with Curved Connection.[2]

HAVING thus described a safe and economical method of jointing our cast-iron pipes, it remains to consider their proportions and general arrangement. We shall, as treating of sanitary plumbing, confine our attention to the piping of the house proper; the consideration of the drainage beyond the house limits belonging more properly to the subject of sanitary engineering.

The Size of Pipes.

The size of soil and drain pipes should not exceed four inches. This is ample to carry off every possible form of discharge or combination of discharges to be met with in plumbing, even in the largest buildings, except for special hotel, laundry or manufacturing purposes. It is a mistake to suppose that because the fixtures are multiplied, the diameter of the soil-pipe must be multiplied correspondingly. It is a rare occurrence, even in a hotel-building, that two or more water-closets are flushed at exactly the same instant, and even if they were, their distance from each other and the capacity of a four-inch pipe would give ample room for the escape of the water. The choking of a pipe is far oftener due to its being too large, or to faulty construction, than to its want of sufficient size. The great perpendicular extension of plumbing pipes also facilitates the discharge, and pipes which for land-drainage would be much too small, will be found ample for plumbing purposes on this account.

When we consider how important it is that the soil and drain pipes should be as thoroughly scoured as possible by the discharges sent through them, and remember that the smaller the pipe the more perfect the flushing, we should be inclined to reduce our soil-pipes to a size even smaller than four inches, were it not for the careless usage slop-hoppers and water-closets are so often subjected to.

The traps of water-closets are very frequently made of pipe as much as four inches in diameter, and large pieces of newspaper are often used where toilet-paper alone is suitable. This, and the carelessness of servants who will throw into a closet anything which is small enough to pass through its trap, would cause a great amount of annoyance and expense, if the soil-pipe were smaller than the trap of the slop-hopper or water-closet. Hence we have fixed upon four inches as both the smallest and the largest size of soil and house-drain pipes, and believe that no other size should be used except for rare and exceptional cases.

The General Arrangement of Soil and Drain Pipes.

All the piping of a house should be in full view. Nothing should be walled in or covered over and rendered inaccessible. One of the first rules of modern sanitary work is to bring everything out of the darkness into light and air, where defects, if they occur, can at once be detected and removed. We are accustomed to running our steam-pipes in plain sight, and rendering them, by gilding or silvering, as ornamental as possible. The same custom is now beginning to apply to our plumbing-pipes. Where they pass through parlors or reception-rooms, they should stand behind movable panels or doors: a little ingenuity on the part of the architect will generally enable this to be done with good effect.

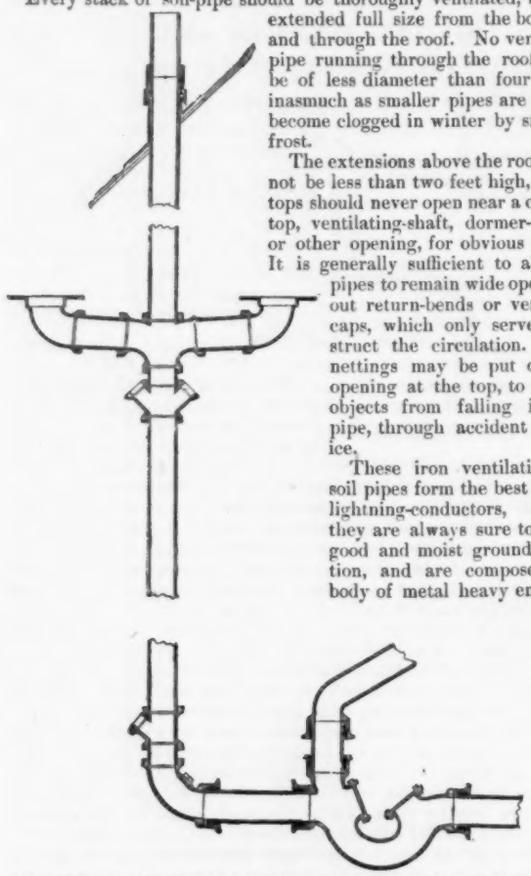
The piping should be arranged to run as direct as possible, and should be concentrated. It will be found very convenient, especially in city houses, to build a broad recess or slot in the masonry of the party-wall, on the line of the bath or toilet rooms, for all the plumbing and ventilating pipes which can be collected together in this

[1] Continued from page 175, No. 459.

[2] These drawings were made for the writer by the Durham House Drainage Company, at his request, to illustrate the points in question.

neighborhood, and, if possible, to run up in this slot the smoke-flue of the furnace, in iron. The heat of the smoke-flue will create a strong circulation in the ventilation-pipe, and at the same time radiate a useful heat into the bath-rooms. The brick recess should be enclosed in masonry on all sides where it passes through the floor, and as high as three or four feet from the ground. This serves to protect the wood-work from danger of overheating. Between this height and the ceiling the recess is open in front, exposing the pipes and admitting the radiant heat from the flue. The various stories are separated from each other by brick platforms, built across the recess on the line of the floors, and made tight around the pipes with cement or mortar. Above the upper bath-room the iron smoke-flue enters a regular brick flue, and the soil-pipe ventilator runs up independently through the roof. The writer has adopted this system in several city houses and found it very satisfactory. The furnace smoke-flue may be constructed of tile instead of iron, if preferred, for greater durability; but if iron be used, it may be made heavy enough to last as long as desired. The recess being, moreover, accessible, the pipe may be renewed at any time without difficulty.

Every stack of soil-pipe should be thoroughly ventilated, by being extended full size from the bottom, to and through the roof. No ventilating-pipe running through the roof should be of less diameter than four inches, inasmuch as smaller pipes are liable to become clogged in winter by snow and frost.



The extensions above the roof should not be less than two feet high, and the tops should never open near a chimney-top, ventilating-shaft, dormer-window, or other opening, for obvious reasons. It is generally sufficient to allow the pipes to remain wide open, without return-bends or ventilating caps, which only serve to obstruct the circulation. Wire nettings may be put over the opening at the top, to prevent objects from falling into the pipe, through accident or malice.

These iron ventilating and soil pipes form the best possible lightning-conductors, because they are always sure to have a good and moist ground-connection, and are composed of a body of metal heavy enough to carry the most powerful charges of electricity without danger of melting; their presence, therefore, in sufficient number, renders the usual form of lightning-rod superfluous.

Fig. 234. — System of Piping showing Fresh-Air Inlet within the Main Trap, the upper vent above the roof and desirable, easy curves on the various branches and fittings.

The soil-pipe should be firmly supported at the bottom. The best support consists in the projection of the foundation wall, or in a stone or brick pier built for the purpose. The junction between the soil and drain pipes should be made with an easy bend, of as large radius as possible, to prevent the accumulation of obstructions and the powerful back-pressure on traps caused by the friction of the air in attempting to pass round a sharp bend in front of a descending column of water in the soil-pipe.

The main drain should run along in full view on the foundation-wall, if possible, or supported by piers resting on the concrete, or hung from the joists by strong iron hangers. Clean-out openings should be provided at all places where sediment or obstructions are liable to collect.

Sometimes it is found convenient to rest the drain directly on the concrete. In this case it is customary to form the concrete in a trench whose bottom pitches with the proper grade to accommodate the drain. The drain should have a fall of half an inch to a foot, if possible, or at least a quarter of an inch to a foot; of course, the greater the pitch the better.

The main drain should be trapped with a running-trap of iron just inside the cellar-wall, or, if this is impossible, outside the house, in a man-hole. The trap should always be accessible and should be provided with clean-out caps with air-tight covers. It is a good plan to run a water-conductor into this trap, to ensure its occasional flushing.

To provide for a complete circulation of air through the soil and drain pipes, a fresh-air inlet of the full size of the drain should enter it just inside (on the house side) of the main trap above described. The mouth of this inlet should open outside of the house, at some little distance from any door or window. Figure 234 shows the manner in which proper circulation is provided.

CONNECTION OF IRON PIPING WITH FIXTURES.

Where a fixture is connected with the rigid iron soil-pipe stack, provision must be made for a certain degree of movement or play on the part of the fixture, in such a manner that the movement shall not crack the joint or in any way loosen it. A settlement of the masonry, a jarring or shrinkage of the floors is certain in a new building to alter to a greater or less extent the relative positions of the fixture and its soil-pipe connection. Injury to the joint from this cause may be prevented in two ways. One of these is to use a sufficient length of lead pipe in all cases between the fixture and the iron stack, and the other is to support the fixture directly on the stack itself, and make it entirely independent of the floors and wood-work.

The first method is used with cast-iron piping and with all fixtures having waste-pipes of small calibre. Lead piping has so much flexibility that a section of even moderate length will permit of a considerable movement on the part of the fixture without injury to the joint. Where the fixture is a water-closet, a length of lead pipe having a horizontal extension of two feet, or its equivalent in any inclined direction, will permit of the utmost shrinkage of joists or settlement of walls liable to occur in good plumbing after the plumbing is connected, without injury to the work.

The second method, that of supporting the fixture directly on the stack, has been successfully employed with wrought-iron piping. Figures 235 and 236 show the manner in which this is done. The closet sets on a cast-iron base firmly attached to the piping, so that a shrinkage of the floor may take place without affecting the joint. Still another method of acquiring the required flexibility has been used with wrought-iron screw-joints, where the closet is at considerable distance from the stack. This method is illustrated in Figures 237 and 238. The cast-iron plate here rests upon the floor, but its waste is connected with the soil-pipe by a so-called flexible joint. A slight fall of the closet would simply turn the pipe at the threading through a small fraction of a revolution, as may be understood by examining the drawing.

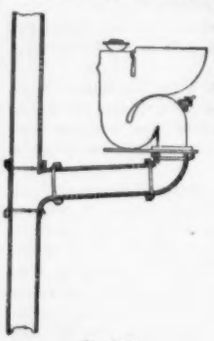


Fig. 235.
Soil-Pipe and short Branch supplying a Water-Closet, with Trap above the floor.

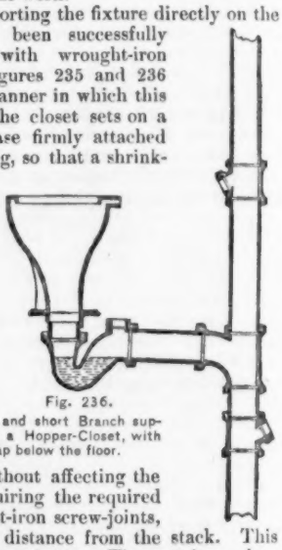
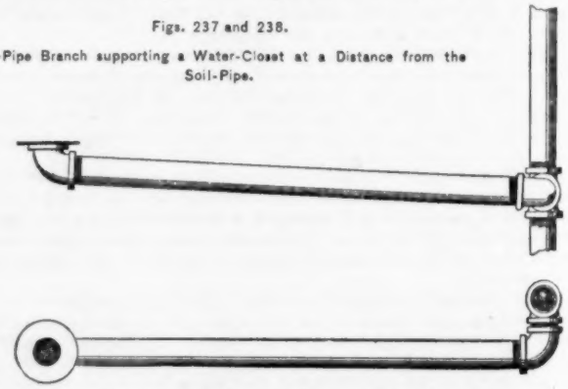


Fig. 236.
Soil-Pipe and short Branch supporting a Hopper-Closet, with Iron Trap below the floor.

Figs. 237 and 238.
Soil-Pipe Branch supporting a Water-Closet at a Distance from the Soil-Pipe.



FORM OF IRON PIPE FITTINGS.

It is important that all angles and bends in our piping should be as smooth and gradual as possible. No sharp angles should be allowed. Thus, if it is ever necessary at any point to use T-connections, they should not be used as commonly cast in common bell-and-spigot fittings, but should have the form shown in the initial cut. But Y-branches are to be preferred to T-branches, and it is very seldom, if ever, that T's are required.

PEPPERMINT AND OTHER TESTS.

The peppermint and smoke tests are useful for application at any

time after the house has been occupied, when it is desired to ascertain if the pipe system has remained sound throughout, especially in places where a leakage of water might not occur. To apply the peppermint test, the vent-openings are first to be closed with plugs. A two-ounce bottle of oil-of-peppermint is then carried up to the roof by an assistant, and its contents poured into the soil-pipe at its mouth above the roof. A pail or pitcher of hot water is immediately poured down after it, and the opening is then plugged up. The assistant remains upon the roof until the examination within the house has been completed; otherwise the odor clinging to his clothes will be likely to follow him into the house. The peppermint is volatilized by the hot water, and should any leak occur it will at once be detected and located by its pungent odor, unless the pipes have been improperly embedded in the walls, or are so covered up that access to them is impossible. If they are set as they should be, everywhere in open view, no difficulty will attend the detection and repair of the minutest defect or leak. The smoke test is applied by means of special bellows manufactured for the purpose (Fig. 239). It enables those whose sense of smell is not acute to operate, instead, with the sense of sight.

Fig. 239. — Asphyxiator for applying Smoke Test.

ART IN CHALDEA AND ASSYRIA. — III.[1]

IN my last chapter I very briefly indicated the reasons which have led the most recent and profound students of the subject to believe that the vault played a most important part in Mesopotamian construction, that Chaldeans and Assyrians were in the habit of roofing their apartments with barrel-vaults, domes, and semi-domes. Many such students believe that this was the *only* method of roofing that was used, but from this opinion M. Perrot differs. He thinks that wooden ceilings may also have been used. Ancient authors indicate that this was the case, and though M. Place found no traces of wooden ceilings at Khorsabad, such traces were discovered by Layard in the adjacent ruins of Nineveh. Yet M. Perrot does not believe that even in this case columnar supports were used. No stone columns have been found, and no fragments of the wood that else must have been used, and no traces on the pavement of any supports whatever having rested there. M. Chipiez publishes an interesting drawing to show how, by certain simple contrivances, Assyrian carpenters may nevertheless have covered apartments too wide to be spanned by a single beam. The method of framing he adopts is not quite arbitrary since it was suggested by an Etruscan tomb, where the ceiling is built of stone beams in a way very evidently suggested by the properties and the use of wood.

And now we come to a neighboring point that has not yet been touched upon — the way in which these Assyrian palaces were lighted. No windows have been found in their remains, although the walls often stand to a height exceeding ten feet. And the bas-reliefs show nothing that can so be called — only toward the top of certain structures narrow openings that are more properly loop-holes. Nor, indeed, was the great thickness of Assyrian walls well adapted to their construction. How, then, were these structures lighted? When the ceiling was of wood it could not have been difficult to introduce light through a lantern-like opening in the centre, and such a device is common to-day in Armenia. Domes, too, may very well have been lighted by an open eye in the centre, as in the Pantheon at Rome, and in the Parthian and Sassanid palaces to which reference has already been made. But with a barrel-vault the case would be different. Here M. Place adopts the following hypothesis and M. Perrot thinks him justified in so doing. In the interior débris of Khorsabad he found a number of terra-cotta cylinders, about ten inches in height and thirteen and a half in diameter. Penetrating the roof at various points these cylinders (more than one being used, if necessary, to form a single conduit) would both ventilate and light the room below.

Another source of light is found in the immense doorways. The entrances at Khorsabad, even those which admitted to store-rooms, kitchens, and other minor apartments, vary from six to ten feet in width, and are wider still when of more importance. And they appear to have been from fifteen to twenty-two feet in height. "When," says M. Place, "we find architects so reluctant as those of Assyria to cut openings of any kind in their outer walls, using doorways of these extravagant dimensions, we may surely conclude that they were meant to light and ventilate the rooms as well as to facilitate the circulation of the inhabitants."

Of course in such rooms there would never be an excessive illumination. It is probable that, in the best of cases, *we* should have called an Assyrian apartment dark, but we must not forget the difference in climate — the fact that whereas the Northern European builder can hardly secure light and warmth enough, the Mesopotamian may well have been content to exclude both as far as convenience permitted. The habits and customs of the East to-day enforce these ideas, and we must remember, too, that though the Assyrian of old was a very different character from the supine Asiatic of to-day, his home occupations were not of our modern sort, and necessitated no such amount of illumination as we require. The outside world was then the active sphere, and indoors, rest and recreation were the chief things to be considered. But as even these immense doors would not alone have admitted a sufficient degree of light, we must believe in the presence of those top-lights which have already been described. Their existence, and the general Assyrian method of construction agree in convincing us that an upper story was non-existent, and still further proof of this is afforded by the absence of all traces of such interior stairways as would have been required had it existed. Some parts of the palace may well have been elevated above others, but only upon a solid foundation of their own.

Outer stairways and inclines for horses and chariots must, however, have given access to the mounds from the plain below. Such stairs and planes exist in the ruins of Persepolis, and a flight of stone steps still stands at Abou-Shareyn in lower Chaldea. But it is not strange that the ordinary brick stairways should have disappeared long before our day. Mr. Layard believes, however, that he discovered their traces at Nineveh, and in the bas-reliefs they are summarily but unmistakably shown. Steps of very slight inclination formed of basalt or gypsum, give communication at Khorsabad between rooms that lie on a different level.

We have thus explained, to quote M. Perrot's words, "how the nature of his materials and the heat of the climate led the architect practically to suppress windows, while he gave extravagant dimensions to his doors. We have now to give a few details as to the fashion in which these large openings were set in the walls that enframed them. . . . Doorways seem to have been generally crowned with a brick archivolt; round-headed doors occur oftener than any others on the bas-reliefs, but rectangular examples are not wanting." The lintels used in this latter case seem to have been generally of wood or bronze, as but a single stone one has been found (in the palace of Sennacherib) — a block of richly-carved limestone; but the threshold was evidently most often of stone. Three systems of flooring have been discovered — beaten earth, brick pavements, and pavements of limestone glass. Beaten earth is almost the only floor found in Sargon's great palace, except in the harem part, but it must of course always have been covered with mats or rugs. In this harem, and in other palaces, we find a most carefully-executed pavement — two layers of large bricks with a thick layer of sand between them, the lower course of brick being set in a bed of bitumen. In the limestone pavements of certain rooms, and of some of the courts, the blocks are of one shape and of large size, and are set without cement. Where the doorways are two or three yards wide and several yards deep, the sill may be considered a pavement in itself, and it was often richly sculptured; always, however, in merely conventional designs evidently imitated from carpets. It is plain that many of these doorways must have been without doors, closed simply by portières; but in others the traces of stone pivots are clearly seen. Stone sills were sometimes replaced by magnificent ones of solid bronze, and Herodotus speaks of jambs as well as lintels of the same material; but the doors must have been of wood, covered with plates of metal. The splendid repoussé bronze bands, now in London, which were discovered at Balawac in 1878, and bear the name of Shalmaneser III, (895–825 B. C.), were the decoration of a door which must have been nearly twenty-seven feet high, and, to judge from the length of the nails, about three inches thick. Assyrian doorways were not only of great actual importance, but their relative importance was even greater, owing to the lack of other openings in the broad façades. Upon them was concentrated the chief part of the exterior decoration; but as has been said, it was not of an architectural character. Mouldings were absent, except in those rare buildings, or parts of buildings, where stone was employed. At Khorsabad, Botta discovered a small isolated building, probably a temple, built of gray limestone, the wall of which has plinth, die, and a true cornice, composed of a small torus, a scotia, and a fillet, not unlike the Egyptian cornice, but inferior to it in strength, simplicity, and finish. On certain buildings discovered by Layard at Warka, was a decoration composed of semi-columns, built of specially-moulded brick and affixed to the façade, evidently a survival from the days when palm-trunks were similarly employed, for they are simple cylinders, without base, capital, or diminution in the shafts. In the wall of the harem at Khorsabad, a similar decorative device is used, and not without good effect. Long, deeply-cut grooves were also used for external decoration, either alone or in combination with these shafts. On the "observatory" or temple at Khorsabad the grooves are used alone, but further variety was produced by building the wall in alternately recessed and projecting sections. Such simple devices must have been more effective than we might at first imagine, for the strong sunlight of the south would bring out all their possibilities of contrasting light and shadow. M. Place believes that the motive originated in carpentry work; but the crenellated battlements, which were so marked

[1] *A History of Art in Chaldea and Assyria*, from the French of Georges Perrot and Charles Chipiez. Illustrated, translated, and edited by Walter Armstrong, B.A. London: Chapman & Hall, New York: A. C. Armstrong & Son, 1884.

Continued from page 138, No. 461.

a feature of Assyrian walls, originated naturally from the use of brick. They are simply formed of two or three "steps" of equal width, and between each pair is a space equal to a battlement turned upside down. Of course such rather bald architectural forms were largely dependent for their effect upon color decoration.

Assyrian altars have been found of various shapes, but they need hardly detain us here. Many kinds of *stèles* have also been preserved, but they are more interesting to the archæologist from their inscriptions than to the art-student. Only one seems to have been discovered which has much beauty. It is tall and slender, and fluted after the fashion of an Ionic column, and crowned by a plume of conventionalized palm-leaves, rising from a double scroll. It looks more Greek than Assyrian, and is very different from the stunted obelisk that is a commoner type. Surface decoration played a very important part in Assyrian architecture, since structural ornament was so entirely lacking. It was in its nature perishable, and so we can get a less accurate idea of the true effect of Assyrian buildings than we can of those ancient styles whose beauty was more strictly architectural. All explorers agree that brickwork, whether crude or burned, was never left without some sort of covering. It was always hidden by a coat of stucco, formed (at least at Nineveh) by a mixture of burnt chalk with plaster, in fact a sort of very adhesive white gum. Its thickness was never more than two millimetres, and yet it was an excellent protector, being still often found in good condition. Some exteriors seem to have had no decoration save its shining whiteness, which was far better in accord with the brilliancy of a southern sun and landscape than with the tones of the north, and which had the merit of making even the smallest structure conspicuous in the vast extent of plain; but more often other colors were used to relieve the white. The stages of the observatory found near the palace at Khorsabad were each about twenty feet high, and each was painted in a solid color of its own. The first was white, the second black, the third red, and the fourth white again. There seem to have been seven stages in all, but the upper three have disappeared. Herodotus gives an analogous description in writing of Ecbatana, the capital of those Medes to whom the destruction of Nineveh was due. Seven was a sacred number with the Chaldeans, and their staged towers were probably always thus proportioned. Painted patterns were also used on palace and city walls. Especially in the interior was the decorator's brush employed. A few fragments of such paintings were discovered and copied by M. Place, but the originals quickly perished on exposure to the air. Human figures were mingled with strictly conventional motives in which the palmette and the rosette were prominent, and in some of which we can clearly see the influence of the weaver's patterns. The colors used at Khorsabad were white in the background and black, green, red, and yellow. Similar fragments were also found by Layard at Nineveh, in one of which was seen the white figure of a bull divided by strong black lines from a yellow ground, the decorative borders being of various tints. All colors were used solid, without gradation. Unimportant rooms were entirely decorated in color, while in the more important apartments the lower part of the wall was cased with those sculptured slabs which are the most famous products of Assyrian art, and these reliefs themselves were touched with color.

But the most important element of color decoration was supplied by enamelled brick. The walls of Sargon's town and palace were evidently left white in their main portions, but were decorated with enamelled brick over their principal doors and at the springing of the battlements. Yellow, white, blue, and black were the colors used, blue being predominant. The motives were usually modelled in slight relief upon the clay, and incised lines were filled with color to mark important points. Inscriptions in large letters, white on a blue ground, often accompanied the pictures, a practice which we see perpetuated to this day in Arabic decoration. The figures of winged genii and animals on a very large scale were built up of several units, thus proving great skill on the part of the enameller. The entire decoration of one of the gates at Khorsabad was stripped off, to be set up again in Paris, but it went to the bottom of the Tigris instead. Certain thin glazed tiles have been found, which were evidently part of a coffered ceiling.

Applied metal, as has been said, and even ivory carvings were used in Assyrian decoration. The ivory plaques seem to have been chiselled, enamelled, gilded, and set in frames of wood. "The more we enter into details," says M. Perrot, "the richer and more varied does the decoration of these buildings appear, though in our day they are sad and monotonous enough. . . . Yet when we bring our scanty vestiges together, we find that enough is left to give the taste and invention of the Assyrian ornamentist a high place in our respect. He was richly endowed with the power of inventing happy combinations of lines, and of varying his motives without losing sight for an instant of his original scheme." We cannot here go farther into the subject of Assyrian decoration, but if the reader will consult M. Perrot's colored plates, or, better still, those in M. Place's magnificent folios, which may be obtained in almost every public library, he will have a very clear idea of its qualities, as to both design and color.

It is only of the Assyrian that we have spoken, but the Chaldean decorators must have used similar means, with the important exception that a sculptured covering to their walls was unknown. Painted decoration they must have been familiar with, and the immense mass of broken enamelled brick found on every Chaldean site proves that it was very prominent in their work. Lacking stone, indeed, they must have used it even more freely than their northern neighbors. Even the outer face of their walls was covered with it in the most sumptuous way, showing figure compositions in which the figures, according to ancient writers, were as much as six feet high. The Babylonian enamel was of a finer sort than the Assyrian, as is shown by the more perfect preservation of its fragments; and there is no doubt but that the earlier Chaldean understood the art as well. Indoors, colored decoration must have been very profuse, as sculpture was not used at all for architectural purposes.

Our knowledge is thus sufficient to enable us to imagine pretty well how the Assyrian palaces looked when in their full perfection. We may picture the immense rectangular mound rising from the level plain, a dazzling white mass touched with brilliant colors, in which, as with all Oriental nations, blue was most conspicuous, and crowned with its crenellated battlements. Set back from the edge of the mound were the long lines of the palace itself, similarly colored and similarly crowned, broken at intervals by huge doorways flanked sometimes by enormous sculptured animals, and encircled by a band of enamelled decoration, in which the boldly conventionalized figures and the varying ornaments were relieved against a blue ground. Imposing the mass must have been, and brilliant under the strong sunlight and on its plain of vivid green. But its effect was chiefly that of mere brute mass; beauty in the best sense could only have existed in the applied decoration. Immensity of mass and applied decoration — these were the elements of Assyrian architecture, not the truer excellence that comes from admirable *structure;* and the same may be said of the interior. Doubtless it was very magnificent, but not with the architectural magnificence of the hypostyle halls of Egypt. Structure went for little; color and applied sculpture and metal-work and woven or embroidered hangings — these were the sources of its charm. Truly the Assyrians were mighty builders, yet it is easy to see the immense architectural superiority of the Egyptians, caused, perhaps, not by a truer feeling for art so much as by the inherent qualities of the materials that each employed. And one wonders once again at the way in which the latest popular historian of ancient art — Von Reber — depreciates Egyptian work, deliberately exalting above it the work of these Mesopotamian builders.

M. G. van Rensselaer.

THE ILLUSTRATIONS.

ABBEY OF THE HOLY TRINITY AT CAEN.[1]

THE Church of the Abbey of the Trinity fronts the north-west. The architrave of the central doorway is composed of many surfaces of great depth: two-thirds of them are flat and plain, and recede so little, as to afford but small opportunity for light and shade. Its decorations are few and simple, consisting almost wholly of the billet and chevron mouldings, the former occupying the exterior, the latter, the interior circles. In the outermost band, the billets form a single row, and take the curve of the arch; the succeeding circles exhibit them with an unusual arrangement, placed compound, and all pointing to the centre of the door. These, with the addition of quartrefoils, and of some grotesque heads, which serve as key-stones to the mouldings over the windows of the triforium, are the only ornaments which the front can boast.

The capitals throughout it are of the simplest forms, being in general little more than inverted cones, slightly truncated, for the purpose of making them correspond with the columns below. Some few of them have the addition of small projecting knobs immediately below the angles of the impost; while those in the square towers are formed by a short cylinder, whose diameter exceeds that of the shaft surmounted by a square block by way of abacus. The towers and buttresses decrease in size upwards. An architectural peculiarity deserving of notice in this front, lies in the triangular mouldings, observable in the spandrels of the arches of the clerestory. The same are occasionally, though rarely found in other buildings of unquestionably Norman origin, as in the church at Falaire, and in Norwich Cathedral in our own country. They are here more particularly noticed, as serving to illustrate what has been considered an anomaly in architecture of some of the round-towered churches in Norfolk and Suffolk, when the windows are formed with heads of this shape. Antiquaries unwilling to admit that the *flat-sided arch*, as it has been called by a perversion of terms, was introduced into England, prior to the fourteenth century, have labored to prove that such windows were alterations of that period, contrary to the evidence of every part of the building.

The east end of the choir presents a bold termination, pierced with ten spacious windows, that give light to the choir, each of them encircled with a broad band, composed of the same ornaments as are found in the rest of the exterior of the edifice. This part of the church is divided in its elevation into three compartments, the lower containing a row of small blank arches, while in each of the upper two, is a window of unusual size for a Norman building, but with small mullions or tracery. The windows are separated by thick cylindrical pillars, which rise from immediately above a row of windows that give light to the crypt. The heads of these windows are level with the surface of the ground; and the wall, in this subterranean part of the building, is considerably thicker than it is above. The balustrade of quartrefoils above appears coeval with the rest, and may be regarded as tending to establish the originality of the nave of the Abbey Church of St. Stephen.

[1] From Cotman's "*Antiquities of Normandy.*"

COPYRIGHTED 1884 JAMES R. OSGOOD & CO.

Col: Stevenson's House & Stables: Blue Hills: Readville, Mass: Mr. W. Ralph Emerson, Arch't.

Rough Sketch of House & Stables.

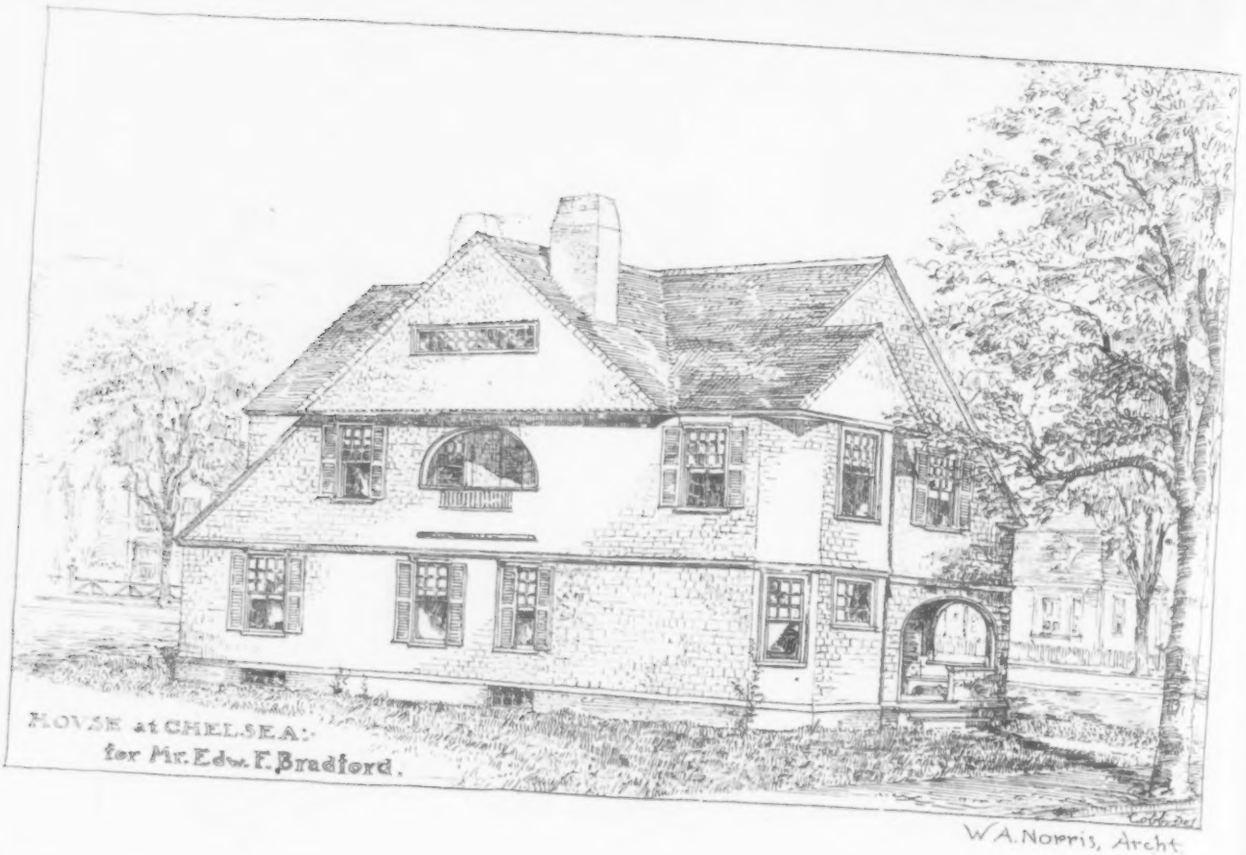
General View of Stable, Coachman's Cottage.

Detail Sketch of Gable Ends of the Stables.

Pencil Sketches by B. Eldon Deane.

HELIOTYPE PRINTING CO. BOSTON.

COPYRIGHTED 1884 JAMES R. OSGOOD & CO.

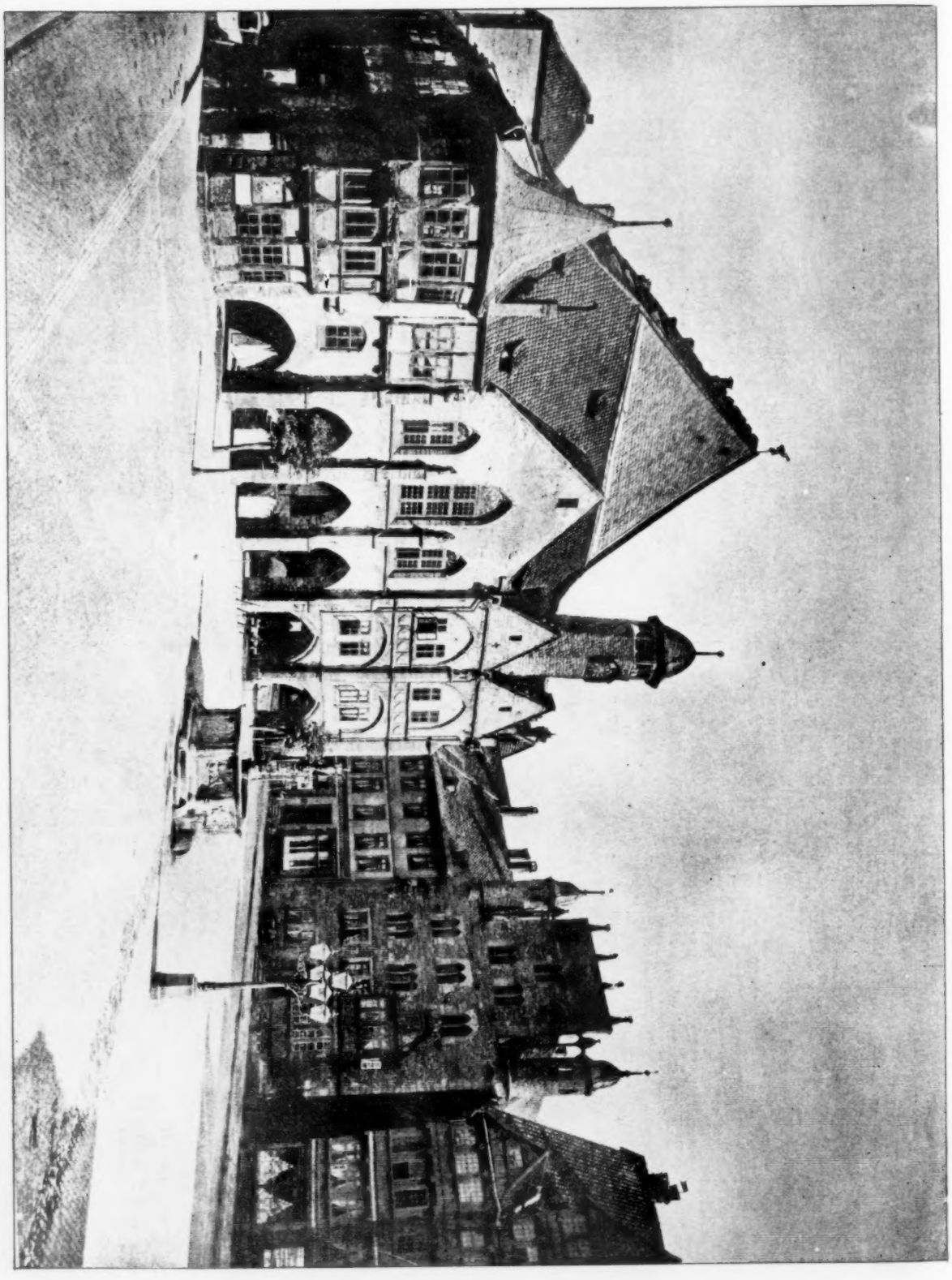


HOUSE at CHELSEA:
for Mr. Edw. F. Bradford.

W.A. Norris, Archt.

HELIOTYPE PRINTING CO. BOSTON

COPYRIGHTED 1884 JAMES R. OSGOOD & CO.

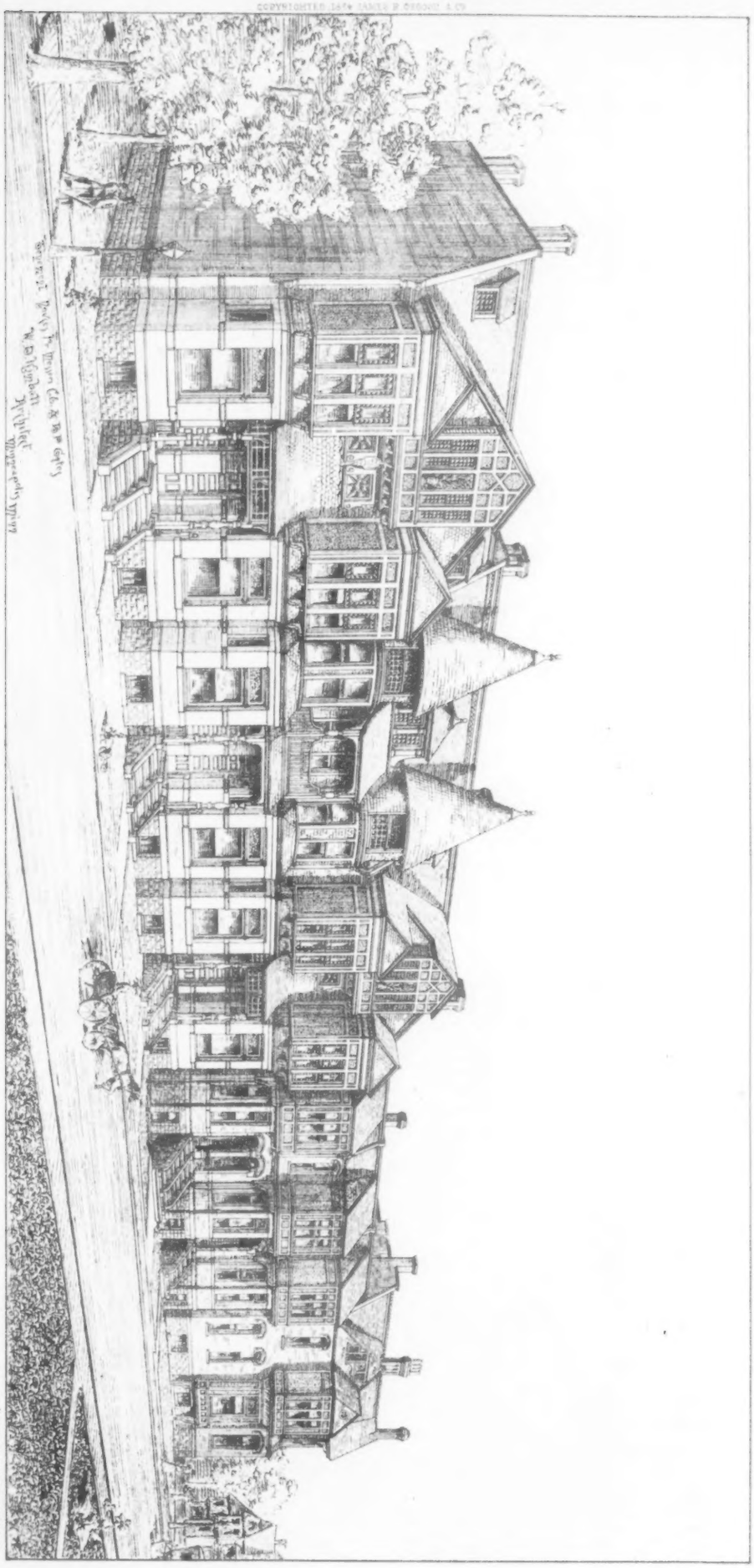


Market Place and Town Hall Hildesheim Germany.

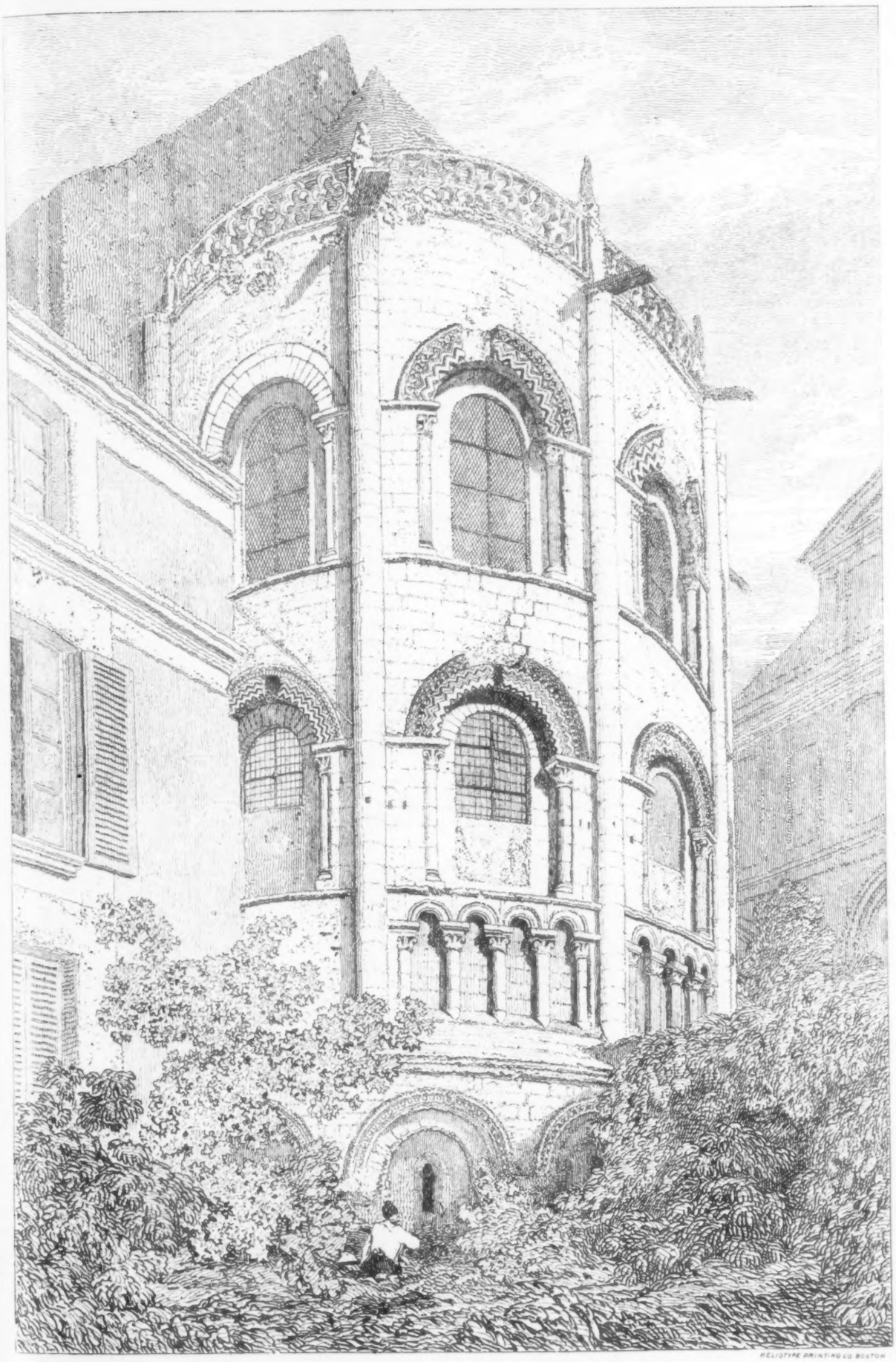
COPYRIGHTED 1884 JAMES R. OSGOOD & CO.

PHOTO CAUSTIC. HELIOTYPE PRINTING CO., BOSTON.

VIEW IN HAMBURG, GERMANY.
(FROM THE BLEACHERY BRIDGE.)



COPYRIGHTED 1884 JAMES R. OSGOOD & CO.



HELIOTYPE PRINTING CO. BOSTON

ABBEY CHURCH OF THE HOLY TRINITY, CAEN.

Finer specimens of the kind can scarcely be seen in Normandy than the two arches which support the central tower; and the decoration of them is very peculiar, consisting altogether of numerous bands of quartrefoils in bas-relief. The sculpture of the capitals is likewise remarkable: that of one of them represents entire rams; while the opposite one has only heads of the same animal at its angles, accompanied with an ornament, which the writer of this article does not remember to have met with elsewhere. The arch that separates the tower from the nave rises higher than any of the rest, and is obtusely pointed; but its decorations correspond with those of the others, and it appears to be of the same date. The string-course in the choir runs immediately below the gallery; but in the transepts, this gallery is upon a different line, being elevated by the interposition of a very beautiful range of small blank arches, between the larger arches below, and the windows of the clerestory; and these latter in conjunction with the small arches, only occupy the same space as the windows of the choir. The northern transept is noted for the curious character of its capitals, many of which taken from Scripture history. But these are, unfortunately, much mutilated.

HOUSE OF E. F. BRADFORD, ESQ., CHELSEA, MASS., MR. W. A. NORRIS, ARCHITECT, BOSTON, MASS.

HOUSE OF WALTER HORTON, ESQ., SHEFFIELD, PA. MR. D. K. DEAN, ARCHITECT, ERIE, PA.

TOWN-HALL, HELDESHEIM, GERMANY.

THIS building, which stands on the Altstädter Mark, dates from 1443. The Roland Fountain, in the middle of the market-place, was erected in 1540.

VIEW FROM THE BLEICHENBRUCKE, HAMBURG, GERMANY.

HOUSE AND STABLE OF R. H. STEVENSON, ESQ., MILTON, MASS. MR. W. R. EMERSON, ARCHITECT, BOSTON, MASS.

A BLOCK OF TENEMENT-HOUSES, MINNEAPOLIS, MINN. MR. W. D. KIMBALL, ARCITECT, MINNEAPOLIS, MINN.

THIS drawing shows six houses, part of a block of twenty-four now building, and which will be completed in a month, at a cost, altogether, of $100,000. This block takes up three sides of a square of ground, is finished in part in hardwood, and has all modern conveniences; owned by Messrs. C. E. Gates and B. P. Gates.

AMERICAN ARCHITECT COMPETITIONS. — NEW SERIES.

AS the busy season for this year has nearly passed, the younger men who have in past years evinced an active interest in the little competitions we have held from time to time, may be ready to test once more their skill in design in competition with their fellows. Therefore we take pleasure in inviting their attention to the following

PROGRAMME.

Most people who live in the country, or in the suburbs of a large town, and have sufficient means, usually feel obliged to "set up their carriage," and of course a carriage implies horses, and a building in which the entire establishment can be housed. Therefore we propose as the subject of the present competition a barn such as the dweller in a house that has cost $5,000 would consider an appropriate adjunct of his establishment: but as this may be somewhat ambiguous, seeing that some men think more of their horses than they do of their families, we will say that the proprieties would be best observed if the cost of the barn should range between $1,000 and $1,500.

The barn must furnish accommodation for two horses and a cow; the carriage-room must be large enough for two wheeled-vehicles, and a sleigh, and proper provision must be made for harness, feed, and hay, and the stableman must not be overlooked. Water and ventilation must also be kept in mind.

Required: — A perspective drawing of the barn, elevations of the sides not shown in the perspective, a plan or plans, and a reasonable amount of detail; all to be included on a single sheet 33″ x 21″, within the framing lines. A short description and the result of a *bona fide* estimate must also be furnished. For the best three designs we will pay equal prizes of thirty dollars each.

Conditions:—Drawings must be received at the office of the *American Architect*, on or before Saturday, December 20, 1884.

The three prize drawings are to remain the property of the publishers.

All designs submitted are subject to publication in the *American Architect* at the pleasure of the editors.

All designs must be sent in signed only by a motto — *not a graphic symbol* — the name and address of the author being sent enclosed in a sealed envelope, endorsed with a duplicate motto.

The jury of award will be composed of three architects.

NOTES FROM ABROAD.

PARIS, September 25.

THE eighth annual exhibition of the Society of Industrial Arts is now in progress in the Palais de l'Industrie. In previous years this exhibition has assumed more the character of a Mechanics' Fair, where everything was on view and for sale, from a patent egg-incubator to a Gobelin tapestry; but the persistent efforts of the Society, which, by the way, has had an existence of only a few years, have resulted in a heightening of the character of the contributions, the present exhibit being confined very closely to objects of art manufacture. The committee of reception was apparently of a different opinion from the Illinois farmer whom we once heard stoutly maintaining that agriculture and mining should be classed among the arts. At any rate, machinery, ordinary industries and patent appliances generally have been carefully excluded, whereby the exposition seems to be on a smaller scale than in previous years; but the loss in quantity is more than made up by the gain in quality, and a better opportunity could not be found for studying the art-industries of France. The exhibition has three marked divisions; the first comprising exhibits of manufactures by private firms, the second illustrating the art-industries of the State, and the last including the nucleus of the long hoped-for Musée des Arts Decoratifs, which was inaugurated four or five years ago in the Pavillon de Flore, as a rival of South Kensington Museum, and though considerably enlarged, has not yet found permanent quarters of its own.

In looking over the furniture exhibits one cannot but be struck with the extent to which English ideas have been grafted upon the conventional French designs. It is fashionable in Paris, just at present, to ape the customs and manners of "perfidious Albion;" not quite as much so, perhaps, as it has been in America; still anything English is considered quite correct, and apparently furniture and decorations are beginning to follow the fashion. Many of the tables, chairs and sideboards exposed are of a semi-Jacobean type, with sawn scroll-work and rococo carvings. The greens and yellows and peacock-blues of the draperies, too, suggest the influence of English ideas, though it must be admitted that French taste has the upper hand everywhere, and the greens are not æsthetically dirty nor the rococo carving misplaced. France does not need to borrow much in art from its neighbors.

There is some very good stained glass exhibited by Charles Champigneulle, *ancien maison* Colletier, the establishment which has executed so much work for the old cathedrals, including that in connection with the restorations of Notre Dame. One window shown is designated as being in the style Renaissance Russe — a rather unusual term, by the way — and is exceedingly strong in design and color; red, yellow, a pale blue, and a light-brown shade being used very harmoniously in interlacing bands and fretwork of a Celtic character, with a central figure in glass-mosaic. There is also some finely-painted glass for the hôtel of Mme. Judic, and a large glass-mosaic, blazing in most brilliant primary colors, for one of the northern cathedrals. This exhibit is placed near the centre of the ground-floor, in a structure which has for its façade the remains of the Abbey of St. Amand at Rouen, a fine example of a Gothic street-front. Opposite this is the pavillion of the President, erected by the Union Centrale des Arts Decoratifs, with two large bronze lions by Cain at the entrance, and large decorative faïence panels by Ehrmann on the walls. In one of the adjoining exhibits is shown a very spirited tile-panel by Sandier, representing St. Catharine, a strikingly artistic effect in pink and yellow, with a few dashes of bright colors.

Some twenty-eight of the choicest Gobelin and Beauvais tapestries are exhibited in a room together, the rival manufactories being on

opposite sides. It is hard to judge a modern French tapestry impartially. One involuntarily thinks of them as paintings; indeed, the "Diane Selène," after Mochard, which is hung in the Museum, is really better than the original painting. As tapestries, as wall decorations, they do not seem in any way successful. Many of the older works, while being in a measure pictorial, are essentially decorative in character, and as tapestries, are far ahead of any of the laboriously-executed works turned out by the Gobelins or Beauvais. It recalls the much-debated question of wooden vaulting, which is right or wrong æsthetically according to one's own standard. The present generation of French artists call for a wall picture with all the texture of a fabric and none of the gloss of an oil-painting, and the modern tapestries are accordingly evolved. But that Frenchmen thoroughly appreciate the value of the old tapestries has been shown in the decoration of the new Hôtel de Ville, where the walls of the Prefet's apartment are hung with fine old tapestries, rich in dark tones and simply expressed figures, made long before the modern Gobelins were thought of.

Few who visit the National Porcelain Factory at Sèvres ever have any idea of the years of preparation required to fit one to make even the humblest of the pieces there shown. In this, as in many other of the art-industries, the French make haste very slowly, and the way in which the foundations for artistic work are laid is shown by the exhibit from the Sèvres drawing-school. It is interesting to note that in preparing a pupil for decorative work on china, the studies are almost entirely of figures from life and the cast, and of details of plant-life and natural arrangement and growth. We remember a leading decorator who used to say that the best study he could find was what he found among the rushes and grasses growing wild beside a little brook in his garden. In the exhibits from the schools of decorative art at Paris and Limoges the same principle is observed. The studies exhibited are nearly all related to porcelain or pottery of some kind, and the hard work, the "grind," is shown to be in the direction of careful, conscientious study of plant forms and of the human body. Nor does such study cease with school work. In an adjoining room is a large collection of sketches and designs by P. V. Galland, and the same kind of study from nature is manifested here as in the work of the beginner at Sèvres, or in the Rue St. André des Arts. In this connection it is interesting to note a contribution to the exhibition by H. D. de Folleville, styled "the history of a branch of clematis," being careful sketches of a growing branch, made successively at short intervals from the time of the first sprout until the full blossom appeared. Together with this the same artist sends in some designs for a ornamental iron-work, intended to show how such a study can be made of practical help.

Several well-known architects have made very interesting contributions to the exposition, contributions such as would probably very seldom be drawn out by a similar exhibition in Boston or London.

M. A. Normand has sixty-four of the drawings made for the Hôtel Pompèien of Prince Bonaparte, mostly studies of interiors and bits of detail, with some full-size details and a few of the cartoons for the decorations. Paul Sedille has a very complete exhibit of studies for the recently-erected Magazin du Printemps, including very explicit plans of the heating and ventilation, elevations, scale-drawings, details, models of the decorative statues, portions of the bronze and iron work, gutters, heads, leaf-work, cartoons for the decoration, and photographs of the work in different stages of progress. They show how thoroughly and conscientiously a good architect can study his work, and how cautiously a Frenchman will feel his way on paper or in plaster, before committing any details to stone or iron. This exhibit did not include any preliminary work; but of a single day there were shown, first a study of the whole to a small scale, then the same to a larger scale, then a portion, colored, to a scale of .075 = 1000; then a large study, carefully figured, and finally full-sized drawings and models.

Architects who have found so much to draw from in the work by Henry Revoil on the Romanesque architecture of the south of France, will be glad to know that a similar work, entitled "*L'Art Bysantin*," is in course of preparation by Charles Errard, under the direction of M. Revoil. A number of the sketches and measured drawings for the work are here shown and attract a great deal of attention from those interested in the subject, as aside from their value as documents, they afford many useful hints in drawing, and suggest a wide field for study. The work is to be published under the patronage of the Ministry of the Fine Arts. C. H. B.

IN THE FOOD GALLERY OF THE HEALTH EXHIBITION, LONDON, ENGLAND.

London, September 29, 1884.

Fig. 1.

As one of the practical illustrations of food, which constitutes the first group of the exhibition, a "*Nippon Rioriya*," or Japanese restaurant, has been opened by Mr. Matsusawa, of Tokio. With Japanese *chefs*, chopsticks, and the small dinner service peculiar to Japan, there is left little doubt as to the authenticity of the viands; they all possess an aromatic flavor so totally different from that to which one is accustomed. Here is a specimen bill of fare, for which a dollar is charged, including tea and *sake*, or Japanese wine, while paper napkin and a Japanese fan are presented to every diner: *misoshiru*, or soup from a fermented mixture of Soy beans, wheat and a salt; *kuchitori*, a dish composed of fresh eggs and sea-weed, fetched up by divers from a depth of three hundred feet, kept for a long time and boiled twenty hours; *hachimono*, or roast; *choku*, dressed vegetables; *han*, boiled rice; *wanmori*, soup; *sunomo*, salad; and *konomono*, vegetables, salted or preserved in *miso* (the fermented mixture above-mentioned). Be it observed that the courses do not follow one another in regular order, but are served altogether, in little porcelain saucers and lacquered wooden bowls, on a diminutive table, so that the diner can pick from each in turn, according to his own sweet will. The dining-room has been fitted up entirely in Japanese style, and the dinner is under the auspices of the Japanese Commissioners.

The Manchester Vegetarian Society, or, to be more correct, the Society of Diet Reformers, on the basis of the vegetable kingdom, whose headquarters are at Manchester, has been arranging a series of thirty-seven-cent banquets, by way of disseminating its views. The first was presided over by that genial author, chemist and metallurgist, Mattieu Williams, who is theoretically, if not practically, one of their kidney. He looked forward to the time when we should digest our food ourselves, instead of getting it done for us by animals, by proxy, as it were, a happy Arcadian condition which would render it unnecessary to employ a certain section of the community in doing the dirty work of slaughtering.

The food group is divided into twelve classes, devoted to prepared and unprepared alimentary substances from the animal and vegetable kingdoms, beverages of all kinds, new varieties of food, practical demonstrations of cookery, the chemistry and physiology of food and drink, with the detection of adulteration, diseases due to improper food, practical dietetics, and models and diagrams relating to the group, and finally, apparatus and processes, machinery and appliances connected therewith, to which latter classes the following notes will more immediately refer.

It should first be mentioned, however, that the Science and Art Department, South Kensington, and the Parkes Museum of Hygiene have sent valuable collections of food-products, with their flesh-formers, nitrogenous matter, fibrin, etc., shown by the actual fat and other substances which they contain, so that one can see at a glance not only the amount of nutriment, but also the component parts of the mutton-chop or loaf that one charges into the human boiler, to raise steam for the battle of life. Crackers, called "biscuits" on this side, are present in infinite variety in the large food gallery. There are the American "sea-foam" wafers, side by side with the traditional "Bath Ollivers," invented by Dr. Olliver, who flourished whilom in the city of Bath; and the famous "water biscuits," of Tunbridge Wells, that were eaten on the "Pantiles," the fashionable promenade of that inland watering-place, as far back as the time of the Stuarts. Close by, Peek, Frean & Co., of London, give away one of their new "health biscuits" to every visitor, as a big advertisement, and they say they are all the better pleased if the same people go to them three or four times over. Huntley & Palmer, of Reading, Berks, whose names are as "familiar in our mouths as household words," on both sides the herring-pond, have erected a really handsome pavilion, that was designed by Owen Jones, for the display of their three hundred and sixty varieties of biscuits, to which they have now added a new one made with honey, partly with the laudable object of encouraging bee-keeping.

The filter most noticeable at the "healtheries" is, without doubt, the *filtre rapide*, invented by M. P. A. Maignen, which has received many medals and has also been selected by the British Government for the Nile Expedition. M. Maignen is a wine-grower at Bordeaux, and originally invented a filter for clarifying the produce of his vineyard, and it is through thus studying the subject of filtration that he was led to evolve his present filter, which has achieved a remarkable success. In a treatise on "Water, Preventable Disease and Filtration," M. Maignen remarks that the word "filter" is traceable, in almost every language, to the Anglo-Saxon "felt," being *filt* in Swedish, *filtre* in French, *feltro* in Italian, and *feltrum* in Latin. Felt, accordingly, composed of the non-combustible and non-putrescible material, asbestos, is the base, though not the leading principle of the *filtre rapide*. In order to act on the impurities held in solution, M. Maignen employs his "carbo-calcis," a very pure form of animal charcoal prepared with lime, deposited automatically ont he asbestos-cloth, and covered with the same substance in a granular form. In the domestic filter, the framework consists of a hollow, perforated cone, made of earthenware, which can readily be withdrawn and cleansed; while in the cistern variety the filtering-frames are of zinc, and flat, instead of conical, thus presenting a larger surface for filtration. In the annexed drawings, Figure 1 shows the internal portion of the *filtre rapide;* Figure 2, the exterior; and Figure 3, its application to the water-service of a house. In Figure 3, *A* is the house cistern; *B*, the filter; and *C*, *D*, *E*, supply-tanks, which may be used to store filtered water, in case the flow from the filter be not sufficiently rapid for requirements. The arrangement may be made in view of affording or

Fig. 2.

not a storage for filtered water, or for filtering the whole or only a part of the supply, at pleasure; but, whatever form and arrangement of the *filtre rapide* be adopted, it is constructed according to M. Maignen's leading principles. That is to say, it contains no mate

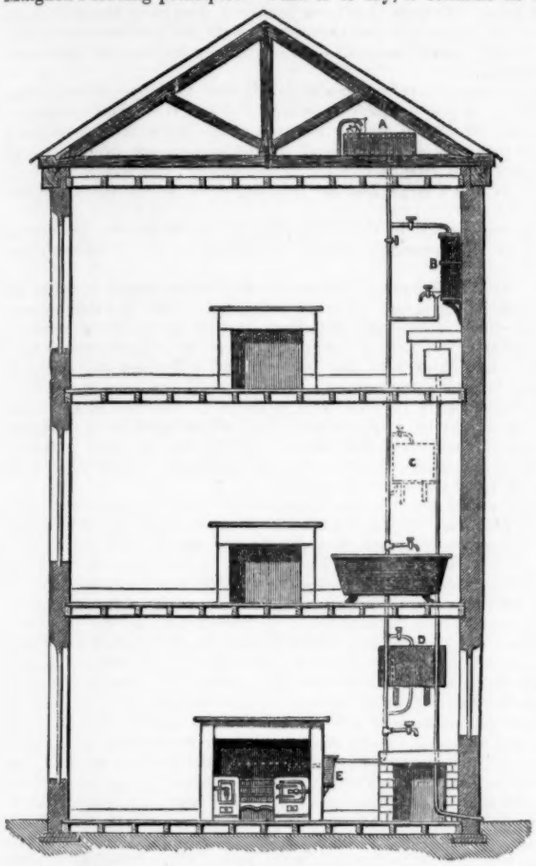


Fig. 3.

rial which can communicate an injurious or offensive quality to the water passing through it. It removes from the water not only all the suspended impurities, but also all the organic and inorganic matter held in solution; it aerates the water, during filtration, by means of a small pipe; finally, the filter is so constructed that the householder can himself take it to pieces, throw away the old filtering medium which has done its work, and replace it with a new charge at slight trouble and expense. To remove hardness in water, M. Maignen has brought out his *anti-calcaire*, in the form of a powder, which may be distributed automatically, and in any desired proportion, by a hopper fitted to the shaft of a small water-wheel, turned by the water entering the supply-tank.

Scarcely less important than pure water are pure milk and undefiled butter. Those essentially domestic engineers, Thomas Bradford & Co., of London, Manchester, Salford and Liverpool, have put up one of their model dairies, for which they received the first prize at the London Dairy show of 1882, and the silver medal of the Royal

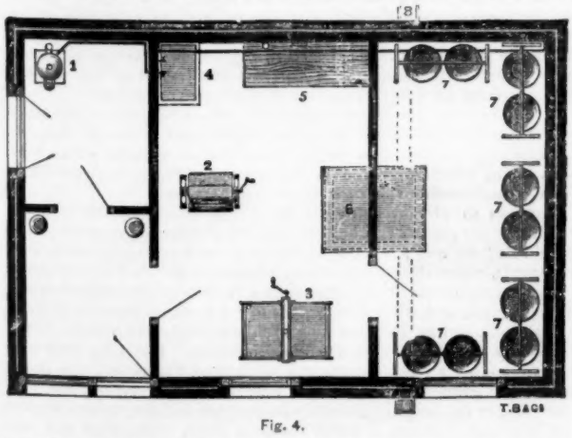


Fig. 4.

Agricultural Society of England, at the York meeting of last year. The accompanying plan and section (Figs. 4 and 5) show the arrangement of the building, which may be adapted to any number of cows, and for which they are prepared to furnish specifications and estimates. The dairy is built of glazed bricks, and consists of four rooms, as under. The vestibule, serving to receive the milk-cans, communicates with the boiler-room, containing the heating-apparatus, marked 1, which also affords sufficient boiling water for scalding the utensils. The milk-setting room, at the other end, contains the shallow, enamelled, cast-iron pans, 7, that turn on vertical axes in iron frames, an arrangement which permits of skimming the milk without disturbing it. The middle is the butter-working room, fitted with the "diaphragm" churn, 2; the new "Albany" butter-worker, 3; a washing-trough, 4; and table, 5. This and the milk-setting room have also a ventilating-chamber, 6, constructed of glazed bricks and having a slate top, which serves as a table. This chamber receives its fresh-air supply from earthenware pipes, 8, communicating with the exterior of the building. The roof is made on the cavity principle, and is surmounted by a "Walness" exhaust ventilator, which, assisted by the hot air led directly from the boiler, rarefies the air in

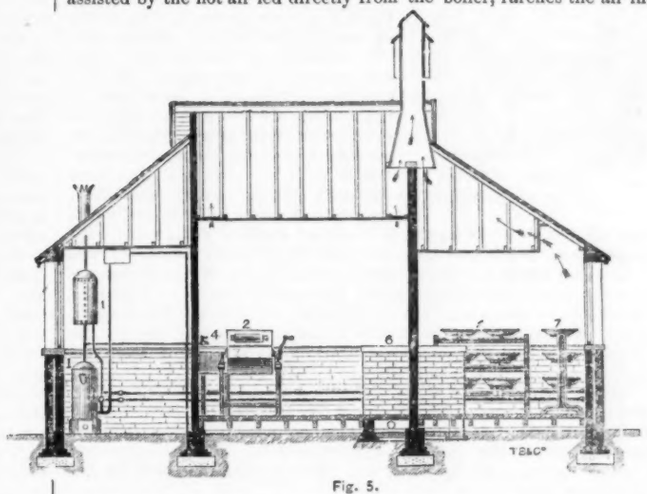


Fig. 5.

the roof-chamber, induces a gentle but continuous current through the dairy, and draws in the fresh air through the channels above mentioned. There is no drain inside the building; but the floor, partly of slate and partly of encaustic tiles, is laid with a slight fall. Along the side is an open earthenware channel, for conveying the drainage into a trapped grid, placed outside the building.

Next door to Bradford's dairy is the stand of Messrs. Joseph Davis & Co., of the Fitzroy Works, London, whose polytechnic barometers, lent to the Commissioners, are distributed about the building. Among a variety of dairy apparatus, they exhibit an ingenious combination of the lactometer with the thermometer, by which the specific gravity of milk or other liquid may be observed at the same reading as the temperature. In the latest form of this combined instrument, the thermometer-tube is carried up above the lactometer scale, for greater ease of observation. In another class, this firm shows a new respirator, for arresting injurious dust that would otherwise find its way into the lungs. The newest form is made of celluloid, which is strong and at the same time very light. It is fitted with valves opening inwards, for the air inhaled (which is filtered through a cotton-wool, easily impregnated with any disinfectant, and renewable at pleasure), and also with separate valves, opening outwards, for the breath exhaled.

Nearly opposite, the stand of the Anglo-American Tin Stamping Company, with its large collection of culinary utensils stamped out under the press, and some of them enamelled and decorated with patterns that make them look just like earthenware, is another interesting stand. This contains the exhibits of Webster's Patent Aluminium Crown Metal Company, which probably finds a place in the food gallery because it contains tools for eating with; but it also contains a great variety of other articles, ranging from presentation swords to the fittings of dressing-cases and work-baskets. All of them are made of aluminium bronze, which is claimed to possess the brilliancy of silver, with the edge of steel, while at the same time not being liable to oxidation. Hitherto it has not been found possible to produce aluminium at a reasonable price, nor in a pure state, so as to unite with other metals; but Mr. Webster, of Birmingham, has succeeded in producing aluminium economically and without a trace of iron.

In the immediate neighborhood is the counterfeit presentment of the diet, on the different days of the week, given to various classes of prisoners, both on "hard labor" and on "light labor." There are also models, sent by Col. Sir E. F. Du Cane, K. C. B., Surveyor-General of British Prisons, of cells in a prison, showing the method of ventilating and warming, the fittings, furniture, etc. One model, a full-sized model of a convict cell, has proved to be a great attraction. Each prisoner has a cell of not less than eight hundred cubic feet capacity; the window has a ventilator, which can be closed and opened by the prisoner, to admit air from the outside. The cell is further supplied with warmed air through a flue, leading from a hot-air chamber under the corridor floor, and entering the cell through a

grating. The flues lead to a horizontal trunk in the roof, whence the air is drawn through the extraction-shaft by the action of a furnace. A gas-light is provided for each cell, accessible only from the corridor, and out of the prisoner's control; while flues are provided for carrying off the vitiated air. A bell communication is fixed in each cell, which sounds a gong in the corridor, while an index label is thrown out at the cell, to show from which cell the signal has proceeded. The cell doors and frames are of wood, lined inside with sheet-iron, and have a glazed hole, with drop-cover on the corridor side for inspection. The cells are made complete for two hundred dollars, or one hundred and twenty-five dollars by convict labor.

J. W. P.

PHOTO-MECHANICAL PRINTING PROCESSES.[1] — I.

NEW DEVELOPMENTS OF THE WOODBURYTYPE PROCESS.

THE printing-press has been the main factor in bringing about that interdiffusion of thought, which has resulted in the widespread and complex civilization of to-day; and it is especially of interest to note that the productions of the printing-press have, even from the first, been permanent: that is to say, the ink used has been one made with a basis of lamp-black, the pigment which, of all others, seems best able to resist the continual breaking strain of time, while writings may be, and indeed often are, gone in the course of a few years.

The introduction of block printing into Europe, the discovery of a new world, and the construction of the camera obscura by Leonardo da Vinci, are events which mark the latter end of the 15th century, a period memorable in the history of our civilization of to-day; the beginning, indeed, of that active fermentation of thought which has made the world what it now is.

When Leonardo da Vinci looked upon the wonderful nature-picture in his camera obscura, and dreamed of the possibility of fixing this shadow, it is difficult to imagine that his wildest thoughts could have led him to suppose the possibility of converting that shadow into a printing block, and making copies in the then new printing-press.

The honor of first fixing the camera image belongs to Nicéphore Niépce, who, in or about 1816, first transferred and fixed the image of the camera upon paper, and not only this, but Niépce actually made printing plates by photographic agency before the year 1827. Those pictures and printing plates, which represented landscapes or general views, were very imperfect, it is true, but, some years before 1827, he made true camera pictures, which were fixed in the technical sense, that is to say, would bear subsequent exposure to air without disappearing, and he thus laid the foundation of those more perfect elaborations of his processes developed by Daguerre and by Talbot.

The perfection of united photography and printing is thus to make the shadow into a solid substance, and so to obtain a plate or block from which impressions can be taken on the printing-machine, and in this direction much practical progress has been made since the time when it was my privilege last to address you.

One point to which allusion has just been made may perhaps be again mentioned. The printer, whether he works from type, from an engraved block, or from a printing surface obtained by the aid of photography, can select his pigment, and, as a matter of fact, he generally selects one of which the basis is lamp-black; consequently, exposure to light and air will not cause the print to fade. The photographer, who makes his pictures by a photo-chemical method, has to content himself with such a coloring material as he can get — generally metallic silver or a mixture of this metal with gold. The consequence is that the earlier photographs are now mostly faded, and one may safely say that not a single copy of Fox Talbot's "*Pencil of Nature*" can be said to have altogether survived the forty years or so which has elapsed since its publication. Notice the copy which is lying on the table, and see if you can find a single picture which shows no sign of fading. The first photo-mechanical process, however, which gave really good representations of scenes of nature, is the photoglyphic method of Talbot, and, although the gradations of tone are not represented in quite the same degree of perfection as is the case with Talbot's pictures by his calotype or silver-printing process, we have the enormous advantage of permanency. Here are some examples of Talbot's photoglyphic method, printed in ordinary carbon ink from the intaglio plate, and issued with the *Photographic News* in 1858. Where, indeed, will you find a silver print a quarter of a century old which shows no sign of fading?

To unite the permanency of the press-print and its rapidity of production with the exactness of the camera picture is the aim of the photo-mechanical experimentalist; and let me now pass on to some of the advances made since the date of my last lectures.

During 1878, Dr. Eder, of Vienna, published a most comprehensive monograph upon the "Reactions of the Chromium Acids and the Chromates on Organic Bodies;" and, considering how largely progress in matters of actual practice is dependent upon sound theoretical knowledge, one is not likely to be wrong in attributing much of the recent progress to the labors of Dr. Eder. The series of articles in question will be found in the volume of the *Photographic News* for 1878. One of Dr. Eder's latest discoveries may be mentioned here. He finds that ferricyanide of potassium tends to make gelatine insoluble, and that exposure to light tends to restore solubility. Possibly useful methods of working may be founded upon this observation.

Great progress has been made during the past five years in the application of photography to lithography and type-block printing; indeed, at the time of my last lectures, it was the exception to find a London printer who made use of photo-transfers for litho work, or of photo-etched zinc blocks for type-printing; but now it would be difficult to find a large London printing-house where these are not in regular use.

From the general to the particular, that is to say, to the special subject of this evening's lecture — printing by the Woodburytype method.

The old Woodburytype method, in which the mould is made by the hydraulic press, has not been improved to any notable extent, but new modes of working have been devised, in which the mould is made without the aid of the hydraulic press; indeed, more than this, for Mr. Woodbury has quite recently devised a method of working in which the gelatine relief is itself the printing-surface, this gelatine being covered with a sheet of thin tinfoil, cemented down by means of India-rubber; but before describing this, the newest and most successful modification, let me call your attention to some of the modes of making a printing mould from a relief without the help of the hydraulic press.

What is now going to be demonstrated will illustrate to you a process for moulding the relief, which was devised by M. Gustave Re. A compressible box, placed upon the bed of this small hand-press, is filled with plaster of Paris in a dry form, and a sheet of tinfoil having been laid over this, the gelatine relief is placed on the tinfoil, and pressure is applied. It is easy to understand that under these circumstances the tinfoil will be forced into all the details of the relief; but in order to produce a solid mould suitable for printing from, it is necessary to take means to cause the backing to consolidate itself together, and for this purpose some water is poured into an outer casing which surrounds the moulding box. Soon after the water has penetrated into the compressed powder, setting takes place, and as this is always accompanied by expansion, the metallic foil is still more closely compressed against the gelatine relief. It is scarcely necessary to say that the press is kept closely screwed up until the plaster has thoroughly set. It is my impression that no commercial use has been made of this ingenious method of moulding, but it, like many other processes, rests ready to hand for any person who may wish to make use of it, or to improve it. Methods of making the printing mould by rolling pressure, instead of the direct pressure of the hydraulic press, have only been decidedly successful when extremely thin sheets of metal, such as tinfoil, have been used, as a thick plate of lead, or other soft metal, extends considerably in one direction when under the action of the rolling press. Casting a printing mould from the relief in sulphur, or in what amounts to about the same thing, the so-called Spence-metal, has been suggested, and Mr. Warnerke has carried the method into practice with success. By melting sulphur at a low temperature, and stirring in about one-sixth of its weight of black lead, a very good casting material is obtained, and this can be easily illustrated to you. Here is a relief which has been developed on a piece of thick glass, and warmed up to a temperature of nearly 50° Centigrade, and having placed a metal rim round the relief, the next step is to steadily pour over it the mixture of sulphur and black lead, so as to form a cast about an inch thick. When this is cold, Mr. Barker will separate it from the glass and make a print from it by the usual Woodburytype method, that is to say, by pouring on to the mould a pigmented, gelatinous solution, laying on a sheet of paper, and then pressing out the excess of the colored gelatine solution by bringing down a rigid and truly flat slab of metal on the paper. When the gelatine has set, the cast in pigmented gelatine will prove to be a perfect picture, showing all the gradations of the original photograph by various thicknesses of the tinted gelatine.

It will interest you to see some casts which Mr. Barry has made in brass and iron from the Woodbury relief, and although these do not appear to possess that perfect evenness of surface which is an essential in printing by the Woodburytype process, they are likely to have considerable value for decorative purposes.

Now, as to Mr. Woodbury's new development of his process, which he calls stannotype. There are two stannotype processes — the old and the new; but the former can be summed up in a very few words, especially as it has been altogether eclipsed by the latter.

The gelatine relief is developed on a rigid support, such as a slab of plate glass, and when the relief is dry a sheet of tinfoil is made to adhere to it, and at the same time to take a perfect impression of the details, by pressure under a rolling machine. The next step is to deposit copper by the electrotype method on the tinfoil, the thickness of the copper thus deposited amounting to about three or four times that of the original tinfoil. The copper backing is now washed and dried, after which a warm sheet of glass, covered on one side with a layer of resinous matter, is laid — coated side downwards — on the coppered plate, and, by the application of a steady and prolonged pressure, the softened resinous matter is made to accommodate

[1] Cantor Lecture delivered before the Society of Arts by Thomas Bolas, F.C.S., and published in the *Journal of the Society of Arts*.

itself to all the inequalities of the electrotyped surface. The whole being now allowed to cool, the complex cast is removed from the gelatine relief, and this cast is used as the printing surface. If you have followed my remarks, it is needless to remind you that the cast consists of the tinfoil facing which was moulded directly against the gelatine original, then the backing or stiffening of electro-deposited copper, next the resinous cement, and finally the rigid plate of glass intended to give strength or body to the whole. Mr. Barker will make a print in a mould of this kind.

The new stannotype process necessitates the use of a transparency as the original photograph under which the gelatinous tissue is exposed; and as regards the preparation of the sensitive gelatine, its exposure and development, there is no need for me to say anything, as this matter was fully treated of in my previous lectures. Carbon transparencies made direct from the original negatives are used, and the representative of Messrs. Woodbury, Treadaway & Co., who is about to demonstrate the whole process, has just developed such a transparency in hot water, and he will now proceed to intensify it by means of a solution of permanganate of potassium.

A sheet of gelatinous tissue, which has been exposed under a similar transparency, is now soaked in water until flaccid, and laid face downwards on a slab of glass, perfect contact being established by the use of the "squeegee." The glass to which the tissue now adhere is next placed in hot water, where the paper backing is stripped off, and all that gelatine which has not been rendered insoluble by the action of light is washed away. In this way a negative relief is obtained on the glass, the high portions corresponding to the light shades of the original subject, and the low portions to the deep shadows. When dry, this gelatine relief itself forms the mould in which pictures are cast or moulded by the ordinary Woodbury method; but before the gelatine mould can be used to print from, its surface must be coated with tinfoil. To do this, a thin solution of India-rubber in benzole is run over the plate, and a sheet of tinfoil being laid on, intimate contact is established by passing the whole between rubber-coated rollers — in fact, an ordinary wringing machine.

All is now ready for the printing. Mr. Woodbury's assistant takes the mould, adjusts it on the bed of a small press, oils the face slightly by a pad of oiled flannel, pours on the gelatine solution charged with coloring matter, lays on a sheet of paper, and closes the press, taking care to leave it closed until the gelatine is thoroughly set, when he will strip off the print.

This, then, is the new stannotype process, as adapted to the requirements of the general photographer who may wish to make fifty prints or more from a negative.

Another application of the Woodburytype method is the so-called photo-filigrane process, in which the water-mark of paper is imitated by rolling a Woodbury relief against the paper with a considerable degree of pressure, the paper being rendered more or less transparent according to the degree of pressure, or in other words, according to the thickness of the relief at any one particular point. In this way photographs of all kinds can be reproduced in water-mark form, and Mr. Barker will show you how very rapidly impressions of this kind can be made on the paper. The method in question is worked commercially by Messrs. Brown, Barnes & Bell, of London and Liverpool, this firm having been good enough to send me the interesting specimens which are before you.

The Woodbury process is specially adapted for making transparencies to be exhibited by means of the optical lantern, and Mr. George Smith, who has been exceptionally successful in executing work of this kind, will now demonstrate to you the whole process of making slides by the Woodburytype method. Instead of laying a sheet of paper on the mould after flooding with gelatine, a glass plate is used, and the cast in tinted gelatine is thus made directly on the glass. Mr. Smith will use an hydraulic press of his own construction in making the relief, and those of you who have studied the construction of appliances of this kind will know how to admire the excellence of the design.

The translation of the Woodbury relief into a line or stipple suited for lithographic or typographic printing is a matter of considerable interest and importance, but it must be considered in another lecture.

QUESTIONS OF INSURANCE.

SO many disputes arise between those who are insured and the insurance companies, says the *Metal Worker*, and so much misapprehension exists as to what an insurance company really agrees to do by the terms of its policy, that the Boston Manufacturers' Mutual Fire Insurance Company have been induced to issue a circular entitled "What Constitutes Indemnity," and to circulate it very extensively as a reply to many of the questions that are constantly coming up. Some of the points which are discussed in this circular have been raised at different times by correspondents of this journal. Accordingly, in presenting the circular entire, we shall no doubt give our readers what will be both interesting and valuable information. In this connection we may remark that while this circular refers particularly to the policies issued by the company above mentioned, those policies in their general features do not differ from the ones issued by other reputable companies. The advice applicable in all cases to those who carry insurance is to carefully read the policies, and become thereby thoroughly familiar with the nature of the contract. The following circular in some respects is of the character of the popular exposition of an insurance policy, and as such is entitled to very careful attention: —

In view of the fact that the attention of our members is seldom called to the exact nature of the contract of insurance until they have the misfortune to be subjected to a loss, it becomes expedient to ask their attention to the terms of the policy, and to the methods which are customarily taken for the purpose of ascertaining the measure of indemnity which the underwriters may have become liable to pay after a fire.

This treatment is especially called for at the present time, as there may have been a considerable change in the value of property insured by us since the policies now in force were issued; it is therefore important that members should fully comprehend the limit within which claims for loss must be kept, lest they should be misled into paying for a larger sum of insurance than they could collect. The following statement is therefore submitted: The contract of insurance is one under which the underwriters promise indemnity to the assured in case of loss or damage by fire. The terms of this contract which are in our policy, and in the policies of all companies in Massachusetts, whether stock or mutual, are as follows: —

1. At the head of the policy it is specified: "This company shall not be liable beyond the actual value of the insured property at the time any loss or damage happens."

2. In the body of the policy its terms are specified as follows: "The amount of said loss or damage to be estimated according to the actual value of the insured property at the time when such loss or damage happens."

After a provision for the rendering of an account subsequent to a fire, it is provided: —

3. "In case of any loss or damage, the company, within sixty days after the insured shall have submitted a statement as provided in the preceding clause, shall either pay the amount for which it shall be liable, or replace the property with other of the same kind and goodness; or it may, within fifteen days after such statement is submitted notify the insured of its intention to rebuild or repair the premises. . . . It is moreover understood that there can be no abandonment of the property insured to the company."

Under these provisions we insure substantially four kinds of property.

First — buildings. Each building differs from every other building. If a building is burned, it is incumbent upon the parties in interest to ascertain what was the value of that building at the time of the fire. Let us assume that it was an old building, the floors of which had become saturated with oil, and in which the timbers may or may not have been sound; in other words, a building, which had become depreciated in the progress of time. Or, on the other hand, it may have been a new building, so lately constructed that in the short progress of time since its construction the timber had been seasoned, and it had become actually worth more than at the time it was built, because it had ceased to require the adjustment of shafting to the shrinkage of timber or to the consolidation of the walls.

In order to determine what constitutes indemnity on buildings, appraisers are appointed, and they decide what it would cost to replace that building; not another sort of building as good as that building for the same purpose, which might cost less, but that particular building. If these appraisers make a deduction for the alleged depreciation of the building, which is not accepted, and the assured refuse to received the award, the remedy provided in the policy is that the underwriters may proceed to rebuild that building.

The practical conclusion of the whole matter, therefore, is, in respect to buildings, that the underwriters may be called upon to substitute another building in the place of the old building burned. The new building may be safer, because not saturated with oil; it may be likely to serve the purpose for a longer period than the old building would have served; but, for the immediate purpose of the assured, it may serve no better purpose than the building burned had served. It follows that by such reconstruction of a building the underwriters have only granted indemnity to the assured for his present loss; that is to say, they have, with as little cost, and as nearly as possible, replaced a building for his use, to serve the exact purpose which the old building served at the time of the fire. In point of fact, no demand for replacement has ever been made upon us. The appraisers' estimates have always been accepted, even when the award has been much less than the original cost of the building.

Let us now consider another, or second, kind of property which we insure: Stock — raw, wrought and in process — confining the present treatment to stock in process, such as cotton or wool upon the cards, spinning frames, slashers, and looms. Under the terms of our policy, we have promised to indemnify the assured for loss or damage incurred upon this property at its value at the time of the fire. What

was its value? Before the fire a large part of such property had no outside market value except as waste; and after the fire it has no market value, if not destroyed, but only damaged, except as damaged waste. Our usual course is to appoint appraisers, who ascertain what indemnity is due to the assured, by computing the cost of the material, allowing for the waste in manufacturing, and adding thereto the proportion of labor which had been expended to bring the stock into the condition in which it was just before the fire. If a part of this stock has been saved in a damaged condition, its value as waste is computed and deducted from its sound value as stock.

The property itself can neither be repaired nor replaced; nor if replaced could it be used, for the reason that a part or the whole of the machinery has been destroyed, and such stock cannot be worked into the same condition it was in before the fire, even by the assured, in any other mill, or even assuming that he should in some way become possessed of a new mill or of new machinery, exactly like the old. In other words, stock in process must either be valued as waste, or else its value must be computed according to our present practice, and under our customary practice an award is made in money which corresponds as nearly as possible to the value of the property to the assured at the time of the fire.

Let us now consider a third class of property: Finished goods consumed by fire or damaged in a storehouse. We have agreed to give indemnity to the assured, with the provision that we may repair or replace the property. We cannot repair the goods, and make them as good as they were before the fire; we cannot replace the goods, because they cannot be made in any other mill so as to be of exactly the same kind and quality. Even if they are printing cloths or standard sheetings, we cannot offer other goods made in another mill in replacement, because the owner cannot put his stamp on them. Our usual course is to ascertain what was the value of the property injured or destroyed at the time of the fire, and this fact is determined by the market value of the goods in cash. The market value may have been more than the cost or less than the cost. By receiving the market value the assured may save commissions and charges which he would otherwise have paid. He may be better off, or he may be worse off, than he would have been had not the fire occurred; but these circumstances and conditions are such that we cannot take cognizance of them, and the method which has been adopted is the only one open to either party for the purpose of determining what constitutes the measure of indemnity to be paid in money.

Having thus treated three subjects of insurance which are likely to change least in their value from one year to another, we now take up the fourth, which is the principal and most difficult class of property to deal with, to wit.: Fixed and movable machinery, apparatus, tools, and furniture. In comparing one period with another during the last twenty-five years, we find a variation in the price of new machinery of over fifty per cent. We are now insuring factories in which the machinery has actually cost twice or more what it would now cost. Moreover, machinery now purchased at the reduced cost would be better and more effective than the old. The next great variation is in the manner in which the machinery has been treated or kept in repair, or maintained by the substitution of new parts for old, and there is as much variation in these matters as there has been in the price of machinery.

A fire occurs, and machinery of one kind or another is injured or destroyed. We have the right to repair or replace. If it has been destroyed, we cannot repair. Can we replace that specific machinery with other machinery precisely like it — that is to say, of the same make, or of the same kind made by the same maker which has been worn or depreciated in the same measure? Obviously such replacement is impracticable in the majority of, if not in all, cases; and even if practicable only in the judgment of the underwriters, such replacement could not be forced upon the assured, except under the order of a court of competent jurisdiction. What would be the chances of such an order be given? Now, then, if repair and replacement are alike impracticable, what was the value of that machinery at the time of the fire? and how is it to be ascertained?

The usual course is for the appraisers to ascertain what was the value of new machinery at the time of the fire, as near like that which has been injured as it is possible to find; then, to learn what had been the method of repair, how well the machinery had been kept up, and thereafter to make a due and sufficient allowance for necessary depreciation, the remainder being considered the value of such machinery to the assured, and, therefore, the measure of the indemnity due to the assured by the underwriters. This mode of determining the measure of indemnity to be paid in money has occasionally been questioned. It may happen that, under certain extraordinary circumstances, like those now prevailing, the payment of such a sum will work a profitable sale of the property, but the rule by which both parties in a mutual contract may yet be governed in this; that, so long as machinery is kept in operation, it is to be assumed that it is so kept in operation because it is profitable to that particular person insured to maintain it as a part of his productive instrumentalities. The indemnity has been promised to him, and the object of the appraisement is to determine what constitutes indemnity to him; that is to say, what sum of money will suffice to place him in the condition in which he was before the fire.

Conclusion. — Under the foregoing conditions — which are substantially the conditions presented to the underwriters by every fire — it is held that the present method of appointing appraisers of approved judgment, who may themselves call in an umpire in case of need, is the only practicable way of giving a just measure of indemnity and of protecting the assured against such loss or damage as a fire may cause to them. In our judgment, even such measure of indemnity as is awarded under the present method of adjustment very rarely compensates the assured for the loss or damage incurred, as we do not insure or attempt to cover the loss of time, and the loss from the interruption of business, which are usually among the most injurious consequences of a fire. A case where the fire has probably worked a sale of a property for a larger sum than could have been obtained for it in any other way is one of the rarest occurrences. In looking over the record of the payments of our losses, I can find but two such cases; there has been one other wherein it was assumed by outsiders that the fire was profitable to the assured, when, in fact, it was very far from being so. In both the cases in which the measure of the indemnity paid may have been more than the property would have brought at public sale there have been circumstances that prevented rebuilding, of which the appraisers could not rightly take any cognizance; and in each case, had the indemnity which was paid been applied to reconstruction without the addition thereto of more capital, the new mill would have been of much less nominal capacity than the one destroyed, although it might have been a more effective mill in itself.

The greater part of our members are corporations, represented by treasurers or agents, who feel it to be their duty to keep the property in their charge fully insured; and the purpose of the mutual underwriters, who act as their agents, is to issue their policies in such form as will give them an absolutely just measure of indemnity for the losses which they may incur; that is to say, such a sum as will enable the assured to put themselves in the same condition as before the fire, so far as an award in money will suffice for such purpose. It should be remembered that attention is given to the character of the members proposed for mutual insurance, as well as to the quality of the risk. There has been but one suspicion of an intentional fire in the whole history of the company, and even in that case it was proved conclusively that there was no ground for such suspicion.

NOTES AND CLIPPINGS.

The Eads' Ship-Railway. — A $10,000 model of Captain Eads' proposed ship-railway over the Mexican Isthmus is on exhibition at Pittsburgh, Pa.

The Church at Stratford-on-Avon. — At a dinner at Stratford-upon-Avon, recently, Sir Francis Cunliffe-Owen promised, with the assistance of Mr. G. W. Childs, of Philadelphia, to organize a fund in America for the restoration of the church where Shakespeare is buried. The amount required for the purpose is £20,000.

The Early Use of India-Rubber. — We have noticed what is probably one of the earliest references to the use of India-rubber for the removal of pencil-marks from paper in a note to the introduction of a treatise on perspective by Dr. Priestley, published in 1770. The author remarks, at the conclusion of the preface, "Since this work was printed off, I have seen a substance excellently adapted to the purpose of wiping from paper the marks of a black lead-pencil. It must, therefore, be of singular use to those who practise drawing. It is sold by Mr. Nairne, mathematical instrument maker, opposite the Royal Exchange. He sells a cubical piece of about half an inch for 3*s.*, and he says it will last several years." — *The Builder.*

The Mean Temperature of the World. — The Royal Meteorological Society indicates the mean temperature of the months of January and July in London for one hundred years. The lowest mean for January occurred in 1795, and was 25.5° Fahrenheit. The highest mean for January, 47°, in 1796. The lowest mean temperature for July was 55.5° in 1816, and the highest 68°, in 1778 and 1859. The Society also marks in a similar way the mean annual temperatures, and the lowest and highest temperatures for several important and well-known places. The mean annual temperatures in this interesting series of records most worthy of note are for Ferozepore, in the Punjaub, 95°; Calcutta, 81°; Hongkong, 75°; Cairo, 71°; Rome, 60°; Constantinople, 58°; Pekin, 53°; St. Petersburg, 40°; Hammerfest, 35°; Fort Enterprise, 14°; Boothia Felix, which upon this ground should surely be rather marked as "infelix," 5°; and Melville Island, zero. The highest temperatures recorded for the several stations are for Murzouk, in Fezzan, 135°; Bagdad, 120°; Cairo, 116°; Jerusalem, 102°; Greenwich, 97°; Moscow, 90°; Falkland Isles, 75°. The lowest recorded are, for Barbadoes, 72°; Singapore, 66°; Bombay, 53°; Jerusalem, 25°; Constantinople, 17°; Greenwich, —10°; Chicago, —30°; Moscow, 53°; Melville Island, —65°; Fort Reliance, — 70°; and Werschjansk, —81°, which outlandishly named, and hard to identify, place, so far seems to possess the unenviable distinction of being the coldest spot upon the earth, unless a station nearer home may be inclined to contest with it the frozen supremacy, upon the ground of an observation that has been made since these comparative records were drawn up. On the evening of the 13th of June last, in the Lecture Theatre of the Royal Institution of Great Britain, in Albemarle Street, a temperature of —252° Fahrenheit, with alcohol turned into a kind of viscid ice, and with oxygen gas congealed into a liquid, was recorded. In this instance, however, it must in meteorological fairness be said the result was brought about by human as well as by natural agency; the spell of boiling solid carbonic acid having been used in the final depression of the temperature. The event is, nevertheless, worthy f a passing mention in this place, as it is probably a record of the oreatest cold that has ever yet been brought under the rigid examinagion of science. — *Journal of the Society of Arts.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

307,093. STONE-DRESSING MACHINE. — Ethan R. Cheney, Chelsea, Mass.

307,109. MODE OF FASTENING METAL-ROOFING TO BUILDINGS. — Henry Flynt, Kansas City, Mo.

307,121. BRICK-MACHINE. — John H. Konefes, Quincy, Ill.

307,131. STAY-ROLLER FOR SLIDING-DOORS. — Alfred B. Mattoon, Owasco, N. Y.

307,150. SCREW-DRIVER AND ADJUSTER. — Cal. Thomas, Terre Haute, Ind.

307,163. PIPE TONGS OR WRENCH. — Elbridge F. and George A. Barnes, New Haven, Conn.

307,173. LINING FOR CHIMNEYS.—Jeremiah Browell, San Francisco, Cal.

306,184. COMPOSITION-MASTIC FOR COVERING ROOFS, TELEGRAPH-WIRES AND THE LIKE.—Andrew Derrom, Paterson, N. J.

307,186. SPRING-JAW WRENCH.—Frank L. French, Meriden, N. H.

307,187. SCREW-DRIVER. — Franklin L. Hamlen and Zachary T. Furbish, Augusta, Me.

307,194. COMBINED VENTILATOR AND DAMPER. — Franklin R. Hogeboom and George O. Woolcocks, Brooklyn, N. Y.

307,195. FLOOR-CLAMP. — Edward W. Holt, Corinna, Me.

307,202. DERRICK. — Patrick Kelly, Poughkeepsie, N. Y.

307,223. PLANE. — Charles H. Pike, West Troy, N. Y.

307,224. FIRE-ESCAPE. — Sylvester A. Price, Eureka, Kans.

307,226 DEFLECTOR FOR WATER-CLOSET BASINS. — John Reid, Yonkers, N. Y.

307,229. BOLT-CUTTER.—John R. Rowlands, Brooklyn, N. Y.

307,239. ELEVATOR.—Thomas Wm. Taylor, Worcester, Mass.

307,247. FIRE-ESCAPE.—Alexander J. Windmayer, Fort Madison, Iowa.

307,248. METAL TONGS. — William W. Winegar, Chambersburg, Ill.

307,249. MEANS FOR RENDERING BUILDINGS FIREPROOF. — G. F. Wright, Palmer, Mass.

307,252. BIT-HOLDER. — Arthur H. Armstrong, Plainville, Conn.

307,256. DRIP-PAN FOR WATER-CLOSET BOWLS. —Quincy M. Backus, Winchendon, Mass.

307,260. BURGLAR-ALARM. — William D. Benson and Thos. B. Lumpkin, Rocky Mount, S. C.

307,274. CHIMNEY-COWL. — John S. Early, Prattsburg, N. Y.

307,281. DOOR-LATCH. — Preston W. Farrar, Nevada, Iowa.

307,321. CARPENTER'S COMBINATION-TOOL. — Sylvester W. Osborn, Elmira, N. Y.

307,323-325. DEVICE FOR REMOVING SEDIMENT FROM THE BOTTOM OF TANKS, CISTERNS, ETC.—John E. Pattison, New Orleans, La.

307,326. DEVICE FOR CLEANING CISTERNS.— John E. Pattison, New Orleans, La.

307,327. BRICK AND TILE KILN.—Jas. W. and Raymond C. Henfield, Willoughby, O.

307,337. ASH-PIT.— Ernest O. Robinson, Pittsburgh, Pa.

307,338. WINDOW-VENTILATOR. — William Scharnweber, Jefferson, Ill.

307,364. CARPENTERS' GAUGE. — William Wells, Cleveland, O.

307,365. DRAWING-BOARD. — Rudolph Schmitz Werotte, Finborough Road, County of Middlesex, England.

307,371. COMPASSES. — Chas. H. Alapaw, St. Louis, Mo.

307,384. STEAM-HEATING APPARATUS. — William W. Forrest, Philadelphia, Pa.

307,395. ORNAMENTAL TILE. — Robert G. Jones, Washington, D. C.

307,419. T-SQUARE. — Charles A. Smith, Central Falls, R. I.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS. — Since our last report twenty-two permits have been granted, the more important of which are the following: —

W. H. Forrester, 2 three-st'y brick buildings, w s McCulloh St., s of Laurens St.

Strawbridge M. E. Church, three-st'y brick parsonage, s w cor. Wilson St. and Park Ave.

Aug. Hanneman, 12 two-st'y brick buildings, s s Hanneman Ave., between Biddle and Chase and Ann and Wolfe Sts.

Owen McKenna, three-st'y brick building, s s Chase St., between McKim and Hilliman St.

Woelk & Pierson, 6 two-st'y brick buildings, e s Hanover St., s of Hamburg St.

W. E. Yeatman, 16 two-st'y brick buildings, w s Bowers St., between Saratoga St. and Wagon Alley.

Thos. Grogen, 2 three-st'y brick buildings, w s McKim St., s of Chase St.

Ch. Mickelman, 4 two-st'y brick buildings, w s Holbrook St., between Preston and Biddle Sts.

Geo. C. Hershman, 6 two-st'y brick buildings, e s Ensor St., between Preston and Hoffman St., and 6 two-st'y brick buildings, w s Chesapeake St., between O'Donnell and Dillon Sts.

ADDITION AND ALTERATION.—Chas. L. Carson, architect, has prepared plans for Robert J. Slater, Esq., for brick alterations and additions to dwell., on Baltimore St., to cost $12,000; Seth Merchant, builder.

Boston.

BUILDING PERMITS.— *Garden St.*, Ward 23, for Highland Ice Co., 2 wooden ice-houses, 1.' x 72' and 40' x 80', pitch; W. H. Fossett, builder.

Deer Island, Ward 2, City of Boston, wooden hospital, 20' x 26' 5", pitch; W. J. Jobbling, builder.

East Fourth St., Ward 14, for J. S. Blatchford, et als., wooden chapel, 35' 6" x 77' 10½", pitch; W. A. Low & Son, builders.

West Sixth St., No. 98, Ward 13, for J. J. Williams, wooden church, 58' 2" x 106' 10', pitch; P. T. Hanlon, builder.

Lamartine St., No. 44, Ward 23, for Jos. Griffin, wooden dwell., 30' x 40', mansard.

Brooklyn.

BUILDING PERMITS. — *Macon St.*, n s, 395' w Marcy Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $6,500; owner, John Fraser, 16 Rochester Ave.

Harrison Ave., No. 13, e s, 50' n Hewes St., three-st'y brick dwell., tin roof; cost, $3,000; owner, etc., John H. Hoffman, 257 Hewes St.

Eleventh St., s s, about 230' e Fifth Ave., 2 two-st'y brick dwells., tin roofs, wooden cornices; cost, each, $4,500; owner, etc., C. B. Sheldon, 296 Ninth St.

Twelfth St., s s, 100' w Seventh Ave., three-st'y brick tenement, tin roof; cost, $6,100; owner, John Button, Blackrock, Conn.; architect, T. Goodwin; builder, John G. Porter.

Bergen St., s s, 325' e Albany Ave., three-st'y frame (brick-filled) double tenement and store, tin roof; cost, $3,000; owner, John Bealy; builders, Powderly & Murphy.

Steuben St., No. 99, e s, 200' n Myrtle Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $3,432; owner, B. Farrell, 101 Steuben St.; builder, John Sorenson.

Fleet Pl., w s, 140' n Willoughby Ave., four-st'y brick tenement, tin roof; cost, $8,000; owner, Frank B. Moore, 348 Bridge St.; architect and builder, O. K. Buckley, Jr.

Elm St., s s, 175' e Bushwick Ave., two st'y frame (brick-filled) tenement, tin roof; cost, $3,000; owner, James Dagan, Elm St.; architect, Frank Holmberg; builder, P. Johnson.

Varet St., Nos. 152 *and* 154, s s, 50' w Bushwick Ave., 2 three-st'y frame (brick-filled) tenements, tin roofs; cost, each, $4,200; owner, Mary Wengler, 49 Varet St.; architect, Th. Engelhardt; builder, Ernst Loerch.

Bergen St., s s, 250' e Albany Ave., 3 three-st'y frame stores, flat tin roofs; cost, $3,500 each; owner, Peter Young, 209 McDonough St.; architect, W. J. Conway.

Nineteenth St., n s, 80' w Eighth Ave., 4 two-st'y frame (brick-filled) dwells., tin roofs; cost, $1,500 each; owner, James Warner, 278 Fourteenth St.; builder, James Crocker.

Rockaway Ave., n e cor. Hull St., 10 two-st'y brick dwells., flat gravel roofs; cost, $3,000 each; owner, Richard D. Robbins, 141 Clifton Pl.; architect, Benjamin T. Robbins; builder, Edward K. Robbins.

Eleventh St., n e cor. Seventh Ave., 3 three st'y brown-stone front stores and flats, flat tin roofs, wooden cornices; cost, $6,500 each; owner, Charles Nickenig, 368 Eleventh St.; architect, Robt. Dixon; builder, L. Bonnert.

ALTERATIONS. — *Jefferson St.*, s e cor. Ormond Pl., altered internally; cost, $5,000; owner, Baptist Society, on premises; architect and builder, E. F. Farrington.

Chicago.

HOUSES. — E. Baumann, architect, has planned the three-st'y dwell. on Indiana Ave., for J. Theurer; pressed-brick front, with ornamental stone trimmings, to cost, $16,000.

STORE. — Architect Quackenboss prepared plans for the five-st'y store to be built at Cottage Grove and Rhodes Ave., for F. C. Porter, to cost, $75,000.

BUILDING PERMITS.—Worth Bros., two-st'y store and flats, 938 North Halsted St.; cost, $4,000.

C. H. Merrell, 2 two-st'y dwells., Marshfield Ave.; cost, $6,000; architect, J. Addish; builders, Barry & Rouatz.

J. Seilheimer, two-st'y flats, 881 North Halsted St.; cost, $3,000; architect, R. F. Boos.

Wm. Dycherman, three-st'y flats, 2551 South Halsted St.; cost, $5,000; architect, J. Frank; builder, Chas. Farr.

W. H. Mason, three-st'y flats, 3034 Wabash Ave.; cost, $14,000; architect, S. D. Cleveland; builder, W. A. Barton.

Andrew Jaicks, 3 two-st'y dwells., 573-577 Dearborn Ave.; cost, $40,000; architect, H. K. Wilson.

Z. Sargisson, three-st'y store and dwell., 402 Blue Island Ave.; cost, $7,000; architect, J. C. Ender.

F. Schulz, two-st'y flats, 182-184 Erie St.; cost, $6,000; architect, F. Washer; builder, W. Miner.

C. H. Harrison, two-st'y flats, Nixon St.; cost, $9,000; builder, W. J. B. Hunter.

N. Cateller, two-st'y flats, 624 Taylor St.; cost, $3,000.

Mrs. L. Fish, two-st'y dwell., 3756 Lasalle St.; cost, $2,600.

D. Byone, three-st'y dwell., 956 West Twelfth St.; cost, $6,000.

C. Bruce, two-st'y flats, 478 North Wells St.; cost, $3,000.

Mrs. M. Kadish, three-st'y flats, 44 Granger St.; cost, $9,000; architects, Furst & Rudolph; builders, Bodmer Bros.

J. Pomeroy, 3 two-st'y dwells., 517-519 Congress St.; cost, $10,000; architect, W. Thomas; builder, P. H. Hayes.

E. A. Grimm, two-st'y dwell., 259 Bissell St.; cost, $5,000; architects, Schraub & Berlin; builders, Eich & Ott.

H. Jessendorf, two-st'y dwell., 203 Webster Ave.; cost, $4,000.

Goldberg & Kalisch, three-st'y store and dwell., 155 West Twelfth St.; cost, $5,000; architect, A. Bressler.

M. Harvey, three-st'y store and dwell., 3115 Indiana Ave.; cost, $7,000; architect, W. C. Root; builder, L. McLachlan.

C. S. Waller, one-st'y church, 429-431 Lasalle Ave., cost, $5,000; architects, J. M. Vanosdel & Co.

M. Hogan, two-st'y dwell., 2214 Dearborn St.; cost, $7,000.

P. Atwater, 2 two-st'y dwells., rear 367 Van Buren St.; cost, $2,800.

U. Busch, three-st'y flats, 186-188 Orchard St.; cost, $10,000; architect, O. A. Matz; builder, L. Kabell.

E. F. Getchell, two-st'y dwell., 387 Ontario St.; cost, $15,000; architects, Burling & Whitehouse; builders, Angus & Gindele.

D. A. K. Steel, two-st'y dwell., 2920 Indiana Ave.; cost, $8,000; architect, G. K. Edbrooke; builder, A. B. Cook.

G. Emmerton, two-st'y dwell., 1192 Washington Boul.; cost, $3,000.

H. L. Borden, two-st'y flats, 57-59 North Ashland Ave.; cost, $8,000; architect, J. S. Stiles; builders, Holberg, Johnson & Co.

T. Schoenheit, two-st'y store and flats; cost, $6,000; architect, M. Sterine; builder, W. Praller.

F. Kruby, three-st'y store and dwell., 129 Nineteenth St.; cost, $7,600; architect, P. W. Ruehl.

J. W. Hood, two-st'y dwell., 699 Warren Ave.; cost, $3,000; architect, H. Copeland; builders, Geo. Lehman & Co.

Chas. Hilscher, three-st'y store and dwell., 3839 State St.; cost, $4,500; architect, J. Frank; builder, A. Brebach.

A. Kichter, four-st'y factory, Huron St.; cost, $15,000; architect, Z. Z. Zarbelle; builders, J. Pratt & Co.

Cincinnati.

BUILDING PERMITS.—C. M. Finner, 2 three-st'y brick houses, Spring Grove Ave., near Thomas St.; cost, $4,500.

Wm. Magly, two-st'y brick building, w s Eden Ave., bet. Oak and Auburn Sts.; cost, $6,000.

Mrs. C. Kirby, two-st'y frame dwell., w s McLean Ave.; cost, $2,500.

C. Hummel, three-st'y brick building, Euclid Ave. cor. Boone St., Corryville; cost, $3,700.

Wade & Tuttle, two-st'y double brick building, e s State Ave.; cost, $4,000.

Hon. Judge Burnet, four-st'y brick building, 101 Longworth St.; cost, $4,000.

Repairs and additions, costing $4,760.

Total number of permits 702.

Total amount, $2,700,793.

New York.

ELECTION week naturally is a poor one for business. Several of our architects are anticipating that clients will give orders to "go ahead" as soon as the excitement is past.

FLATS. — At the cor. of One Hundred and Sixteenth St. and Eighth Ave. it is proposed to have built an apartment-house, 26' x 75', with elevator to connect with Elevated Railroad, to cost about $110,000; from designs of Messrs. D. & J. Jardine, who have also drawn plans for 10 two-st'y stores, with apartments above to be built on the e s of Ninth Ave., from Seventy-second to Seventy-third Sts., for Messrs. Lespinasse & Friedman.

HOUSES. — For Mr. C. Duggin, 5 four-st'y and basement brown-stone dwells., are to be built on the s s of Seventieth St., commencing 125' e of Madison Ave.

BUILDING PERMITS. — *Ninety-ninth St.*, s s, 210' e Third Ave., two-st'y brick factory, gravel roof; cost, $11,500; owner, John B. Smith, 142 East Sixty-fifth St.; architect, R. N. Anderson; builder, John H. Adamson.

One Hundred and Fifty-fifth St., 350' w Courtland Ave., three-st'y frame dwell., tin roof; cost, $3,000; owner, Mr. Willis, of Willis & Dyer, Ninety-second St., near First Ave.; architect, Henry Dudley.

Pitt St., No. 104, five-st'y brick tenement, tin roof; cost, $6,000; owner, Wm. Buhler, 340 West Eighty-fourth St.; architect, Wm. Graul.

Pitt St., No. 106, five-st'y brick tenement, tin roof; cost, $8,000; owner and architect, same as last.

Seventh Ave., s e cor. One Hundred and Thirty-fourth St., two-st'y brick dwell. and store., tin roof; cost, $3,000; owner, John Bradt, No. 502 West One Hundred and Twenty-fifth St.; architect, Andrew Spence.

Mulberry St., No. 241, six-st'y brick tenement and stores, tin roof; cost, $18,500; owner, Philip Braender, Avenue B, bet. Eighty-fourth and Eighty-fifth Sts.; architect, John Brandt.

Fifty-fifth St., s s, 275' w Tenth Ave., five-st'y brick silk factory, tin roof; cost, $30,000; owner, Jacob New, 109 Grand St.; architect, J. H. Valentine.

One Hundred and Ninth St., n s, 200' w Fourth Ave., five-st'y brick tenement, tin roof; cost, $15,000; owners, Sinclair & Mawson, 2089 Second Ave.; architects, Cleverdon & Putzel.

Independence Ave., e s, 50' n Riverdale Ave., two-st'y frame dwell., slate roof; cost, $9,000; owner, Albert E. Putnam, Spuyten Duyvil; architect, Montrose W. Morris; builders, Sage & Wilkins.

Ninety-third St., s s, 140' e Third Ave., two-st'y brick boiler-house and coal-shed, tin roof; cost, $35,000; owner, Geo. Ehret, Ninety-second St., between Second and Third Aves.; architect, A. Pfund & Son.

East Seventy-sixth St., No. 416, two-st'y brick stable, tin roof; cost, $3,000; owner, Henry Wiesen, 529 East Thirteenth St.; architect, Ernest W. Greis.

Seventy-sixth St., s s, 248' e Avenue A, one-st'y frame coal-shed, tin roof; cost, $4,000; owner, Louis Spitzer, 452 East Eighty-first St.; builder, H. Royemann.

Ninth Ave., s e cor. Ninety-seventh St.; Ninth Ave., e s, 75' 9" s Ninety-seventh St., and s s Ninety-seventh St., 100' e Ninth Ave., 3 five-st'y brick tenements and stores, tin roofs; cost, $16,000, $15,000 and $14,000; owner, Charles Bornkamp, 306 West One Hundred and Twenty-seventh St.; architects, Maclay & Davies, 120 Broadway.

Sixty-second St., n s, 225' w Tenth Ave., five-st'y bribk flat, tin roof; cost, $16,000; owner, Annie Kelly, 503 West Sixty-first St.; architect, Bernard McGurk.

One Hundred and Thirty-first St., s s, 125' w Seventh Ave., 6 three-st'y brown-stone front dwells., tin roofs; cost, each, $9,000; owner, Wm. McKeynolds, 125 West One Hundred and Thirty second st., architect, A. McKeynolds.

Hull Ave., n w cor. Suburban St., two-and-a-half-st'y frame dwell., slate and tin roof; cost, $4,500; owner and builder, D. N. Smith, Fordham, architect, D. S. Cooper.

Sixty-first St., n s, 100' e Second Ave., six-st'y brick factory, tin roof; cost, $30,000; owner, Andrew B. Yetter, 222 East Sixty-second St.; architect, F. T. Camp.

Seventy-seventh St., n s, 75' w Lexington Ave., 2 five-st'y brown-stone front flats, tin roofs; cost, each, $20,000; owners and builders, Kennedy & Dunn, 959 Third Ave.; architects, Thom & Wilson.

Lincoln Ave., n w cor. Southern Boulevard, three-st'y brick factory, tin roofs; cost, $8,000; owner, Annie Deileth, 585 East One Hundred and Thirty-fourth St.; architect, J. W. Cole.

Third Ave., s e cor. One Hundred and First St., 4 five-st'y brown-stone front tenements, tin roofs; cost, each, $18,000; owner, Anthony A. Hughes, 2063 Fifth Ave.

One Hundred and Twenty-fifth St., s s, 80' w Second Ave., five-st'y brick tenement and store, tin roof; cost, $20,000; owner, Thomas J. O'Kane, 144 Alexander Ave.; architect, J. H. Valentine.

West Sixty-second St., No. 433, four-st'y brick tenement, tin roof; cost, $10,000; owner, John W. Stilger, on premises; architect, C. F. Ridder, Jr.

One Hundred and Forty-eighth St., s s, Willis to Bergen Aves., four-st'y frame tenement and store,

tin roof; cost, $14,000; owner, Anton Loeffler, 134 North Third Ave.; architect, Adolph Pfeiffer.

Alterations. — *Second Ave., No.* 1021, two-st'y brick extension, tin roof, take out wall in rear of first st'y, and put in iron girders; cost, $3,500; lessee, Adolph Leffler, on premises; architect, Wm. Graul; builder, John Goerlitz.

Third Ave., e s, 212′ s One Hundred and Sixty-ninth St., repair damage by fire; cost, $10,000; owner, David Mayer, 1304 Fifth Ave.; architects, Schwarzman & Buchanan; builders, List & Lennon.

First Ave., n e cor. Nineteenth St., take down gable wall and rebuild same, new store front and internal repairs; cost, $4,000; owner, Elizabeth Seitz, No. 18 Beekman Pl.; architect, John Brandt.

Philadelphia.

Building Permits. — *Lancaster Ave., No.* 4608, two-st'y addition to foundry, 26′ x 46′; Geo. B. Sithens, contractor.

Green St., No. 2309, 13 two-st'y dwells., 16′ x 40′; Jas. Caven, owner.

Second St., n of Lehigh Ave., 2 three-st'y dwells., 16′ 6″ x 44′, Patrick Heron, owner.

Chestnut St., No. 3018, office-stable, workshop and boiler-house, 25′ x 55′ and 40′ x 119′; Wm. Graef, owner.

Passayunk Ave., s e cor. Juniper St., 3 two-st'y dwells., 14′ x 28′ and 15′ 4″ x 43′; B. Harvey & Sons, contractors.

Haines St., between Cedar Lane and Chew St., 2 two-st'y dwells., 16′ x 42′; John Schuler, contractor.

Tasker St., n w cor. Pallas St., two-st'y dwell., 15′ 6″ x 44′; Thos. P. Twibill, owner.

Nicetown Lane, between Twentieth and Twenty-first Sts., 2 three-st'y dwells., 15′ x 55′; Jas. Howard, owner.

Noble St., s s, e of Twelfth St., four-st'y factory, 100′ front; L. Havens, contractor.

Melrose St., above Margaretta St., two-st'y dwell., 14′ 8″ x 40′; W. W. Worrell, contractor.

Old York Road, above Angle St., two-st'y brick building, 14′ x 40′; Benj. Walker, contractor.

Wiesner St., e of Twelfth St., 4 two-st'y dwells., 16′ x 28′; Jos. Stuckey, owner.

Locust St., s s, w of Fourth St., one-st'y addition to church, 39′ x 46′; D. L. Thomas, contractor.

Rural Lane, s s, between Allen's Lane and Gowen St., three-st'y dwell., 31′ x 44′; Tourison Bros., contractors.

Church St., w s, s of Musgrove St., 6 two-st'y dwells., 13′ 4″ x 29′; John Breedling, contractor.

Krans Ave., n w cor. Mitchell St., 3 two-st'y dwells., 16′ x 40′; Frank Gillett, contractor.

Cambridge St., between Fifteenth and Sixteenth Sts., three-st'y dwell., 14′ x 40′; B. Ketcham, contractor.

Eighth St., above York St., two-st'y dwell., 18′ x 57′; Geo. Dieple, owner.

Seventh St., between Cumberland and Huntingdon Sts., 8 three-st'y dwells., 16′ x 43′; Amos D. Kennedy, owner.

Ontario St., between Twentieth and Twenty-first Sts., 4 three-st'y dwells., 16′ x 44′; D. McNeil, owner.

Erwin St., s of Washington St., two-st'y dwell., 14′ x 38′; Thos. Waters, owner.

North Fourth St., Nos. 2244 *and* 2246, two-st'y stable, 32′ x 33′; S. M. Button, contractor.

Mervine St., No. 1703, three-st'y stable, 20′ x 40′; Fred. Wollenben, contractor.

St. Louis.

Building Permits. —Seventy-six permits have been issued since our last report, seventeen of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows: —

Antnony & Kuhns Brewery, two-st'y bottle-shop; cost, $7,000; E. Jansen, architect; B. Weber & Co., contractors.

H. Koste, two-st'y dwell.; cost, $3,000; O. P. Koenig, architect; L. Stricker, contractor.

P. Conway, two-st'y dwell.; cost, $3,000; O. Malley & Bros., contractors.

Mrs. T. Joelhoefer, 3 adjacent two-st'y stores and tenements; cost, $8,600; M. Frederick, contractor.

I. G. Baker, two-st'y dwell.; cost, $8,000; C. May, architect; contract sub-let.

G. Campbell, two-st'y dwell.; cost, $11,500; A. Gravle, architect; J. Stimple, contractor.

J. Cannon, 2 adjacent two-st'y dwells.; cost, $7,000; H. Redmond, contractor.

Jno. Adams, 2 adjacent two-st'y dwells.; cost, $6,000.

L. Yaeger, two-st'y dwell.; cost, $3,200; C. May, architect; L. Yaeger, contractor.

J. B. Ghio, 2 adjacent two-st'y dwells.; cost, $4,500; A M. McCormack, contractor.

Siphen Wrig, two-st'y tenement-house; cost, $4,800; Aug. Wieden, contractor.

G. Neumeister, two-st'y brick dwell.; cost, $4,00; G. Neumeister, contractor.

M. B. Scanlon, 2 adjacent two-st'y dwells.; cost, $4,000; M. B. Scanlon, contractor.

D. Gunn, 2 adjacent two-st'y tenements; cost, $2,700; C. Winkel, contractor.

G. Brandsletter, two-st'y brick dwell.; cost, $5,500; A. Whri, contractor.

Mrs. K. Williams, two-st'y brick dwell.; cost, $3,500; Jno. Waters, contractor.

Hy. Helpers, two-st'y brick dwell.; cost, $4,500; contract sub-let.

Estate of J. J. Roe, six-st'y stores and office-building; cost, $170,000; T. D. Lee, architect.

C. Hoeffermann, 2 double two-st'y brick dwells., cost, $3,400. J. Stewart & Sons, contractors.

H. Vogelsang, 2 adjacent two-st'y dwells.; cost, $5,000; J. H. Keefe, contractor.

J. J. Lawrence, two-st'y brick dwell.; cost, $12,-500; S. M. Ross, contractor.

J. J. Lawrence, two-st'y brick stable; cost, $2,500; S. M. Ross, contractor.

C. S. Pennell, 2 adjacent two-st'y brick dwells.; cost; $6,000; Frank Green, contractor.

C. S. Pennell, 2 adjacent two-st'y brick dwells.; cost, $6,000; Frank Green, contractor.

F. Peters, 2 adjacent two-st'y brick dwells.; cost, $3,500; B. J. Goesse, architect; H. Shildmann & Co. contractors.

A. E. Gottschalk, two-st'y brick dwell.; cost, $4,-000; J. B. Aspen, contractor.

R. Ahlendorf, two-st'y brick dwell.; cost, $4,800; Wm. Gahl, contractor.

Wm. Heman, two-st'y brick dwell.; cost, $3,600; Wm. Heman, contractor.

Wm. Heman, two-st'y brick dwell.; cost, $3,600; Wm. Heman, contractor.

Wm. Heman, two-st'y brick dwell.; cost, $3,600; Wm. Heman, contractor.

Wm. Heman, two-st'y brick dwell.; cost, $3,600; Wm. Hemans, contractor.

Wm. Heman, two-st'y brick dwell.; cost, $4,500; Wm. Heman, contractor.

Mrs. M. Zink, 2 adjacent two-st'y tenements; cost, $3,700; Wm. Popp, contractor.

Thos. Kruger, two-st'y brick dwell.; cost, $2,600; Rothe & Rattieman, contractors.

W. Gundefinger, two-st'y brick stores and tenements; cost, $3,500; sub-let.

C. F. Koenig, two-st'y brick dwell.; cost, $3,200; E. Mortimer, architect; J. Schenk, contractor.

Jno. Muckerman, 2 adjacent two-st'y tenements; cost, $3,400; Wm. Heskerhoff & Bro., contractors.

W. Merrill, 2 adjacent two-st'y dwells; cost, $3,-000; W. Merrill, contractor.

P. McGrath, two-st'y brick dwell.; cost, $3,000; J. McNamara, architect; Pat. McCarthy, contractor.

Thos. C. Higgins, 3 adjacent two-st'y dwells.; cost, $4,000; T. J. Furlong, architect; Thos. C. Higgins; contractor.

Aug. Portmann, 3 adjacent two-st'y dwells.; cost, $8,000; Brinke & Co., architects; Henry Windt, contractor.

St. Paul, Minn.

Building Permits. — C. H. Schnittger, one-st'y frame dwell., n s of Wallace St., between Arcade and Mendota Sts.; cost, $2,500.

J. Desjardins, three-st'y brick block, s s of St. Anthony Ave., between Kent and Dale Sts.; cost, $5,500.

S. W. Underwooker, two-st'y frame dwell., on Marshall Ave., between Mackubin and Kent Sts.; cost, $3,000.

Joseph Rothschild, two-st'y frame dwell., n s of Summit Ave., between Wabasha and St. Peter Sts.; cost, $2,900.

John Godkin, two-st'y frame dwell., n s of Yale, between Dale and St. Albans St.; cost, $2,450.

Wisconsin Central Railway Company, one-st'y freight-house, n s of East Third St., between John and Willius Sts.; cost, $5,000.

Dennis Ryan, one-st'y brick boiler-house, between Sixth and Seventh Sts., to Ryan Hotel; cost, $5,000.

R. C. Wiley, two-st'y frame double dwell., s s of Pleasant Ave., between Ramsey and Forbes Sts.; cost, $6,500.

S. Rochette, two-st'y brick double dwell., w s of Cedar between Thirteenth and Fourteenth Sts.; cost, $5,000.

H. Z. McAfee, two-st'y frame double dwell., n s of Selby Ave., between Mackubin and Kent Sts.; cost, $4,075.

W. F. Sleppy, two-st'y frame dwell. n s of Dayton Ave., between Mackubin and Kent Sts.; cost, $4,500.

Marcella Deavitt, part of a two-st'y brick block, n w s of West Seventh St., between James and Randolph Sts.; cost, $5,000.

Henry Horman, stone foundation for brick block, w s of Dakota Ave., between Chicago Ave. and Channel Sts.; cost, $1,600.

Bertha Theobald, two-st'y frame block of dwells., n w s of Pleasant Ave., between Walnut and Western Sts.; cost, $6,000.

St. Paul Foundry Company, one-st'y brick pattern-shop, w of Como Ave.; cost, $3,000.

J. J. McCardy, two-st'y frame dwell., s s of Selby, between Arundel and Western Aves.; cost, $2,800.

Liedertafel Singing Society, frame hall, e s of State st., between Susan and Winifred Sts.; cost, $8,000.

St. Patrick's Church, one-st'y frame church, e s of Mississippi, lot 7, block 2; cost, $3,500.

E. F. Krahmer, three-st'y brick block of tenements, 45′ x 115′, cor. Sixth and Oak Sts., between Fifth and Sixth Sts.; cost, $17,400.

Frank P. Blair, two-and-one half-st'y double frame dwell., 36′ x 40′, e s of Arundel St., between Dayton and Marshall Sts.; cost, $5,000.

Kinney Bros., two-st'y brick block of stores and dwells., 70′ x 100′, n w s of East Seventh St., between Bradley and Railroad; cost, $10,000.

Washington, D. C.

Seventh St., cor. Market Pl., n w, five-st'y brick store, 43′ 6″ x 116′ 3″, for A. Sako & Co.; cost, $75,-000; Jno. Fraser, architect; Kenderdine & Paret, builders.

Virginia Ave., bet. Ninth and Tenth Sts., s w, 2 two-st'y brick dwells., for A. F. Barker; cost, $7,000.

Penn. Ave., cor. Fourteenth St., n w, four-st'y brick office, for B. and O. R. R. Co.; cost, $10,000.

Mass. Ave., bet. Seventeenth and Eighteenth Sts., n w, 2 three-st'y brick dwells., for Dulaney & Whiting; cost, $3,000; Jas. C. Sprigg, architect; James Westerfield, builder.

Fourteenth St., n w cor. Q St., two-st'y brick dwell., for D. F. Fealey; cost, $3,500.

H St., bet. Sixth and Seventh Sts., n e, two-st'y brick store and dwell., for Robt. W. Blair; cost, $3,-200; C. C. Meads, builder.

Mass. Ave., bet. Twentieth and Twenty-first Sts., n w, three-st'y brick dwell., for A. S. Worthington; cost, $12,000; F. Pilling.

General Notes.

Aledo, Ill—Church, First Presbyterian; cost, $5,000; C. A. Dunham, architect, Burlington, Iowa.

Arlington, Md.—P. L. D. Newman, Esq., is to have built a two-st'y frame house, to cost $10,000; from designs by Geo. A. Frederick, architect, Baltimore.

Bridgeport, N. J. — Work on the new armory has begun at Main St., East Washington and Housatonic Aves.

Burlington, Iowa.—Methodist church; cost, $70,000.
First Episcopal Church, brick; cost, $20,000.
Episcopal church, stone; cost, $16,000
School-house, West Burlington; cost, $7,000.
P. A. Andre, residence, stone; cost, $30,000.
R. M. Green, residence, brick; cost, $9,000.
Wm. Sillies, residence, brick; cost, $11,000.
S. B. Little, residence, wood; cost, $5,700.
John Blont, Jr., residence, brick; cost, $4,500.
Hon. David Rover, residence, stone; cost, $15,000.
John Sherfz, residence, brick; cost, $9,000.
C. A. Dunham, architect, Burlington, Iowa.

Carlisle, Pa. — Chas. L. Carson, architect, Baltimore, has prepared plans for the J. W. Bosler Memorial Library, Dickinson College, to be built of brick and Hummellstown stone, 75′ x 100′, and to cost $90,000; Geo. Rice, builder.

East Orange, N. J.—The following houses are being constructed from plans prepared by S. W. Whittemore, architect, Brick Church, N. J.: —
Three-st'y brick store and flats, for Harrison Bros., Main St.; cost, $7,000.
Three-st'y brick store and flats, for George Booth, Main St.; cost, $7,000.
Two-st'y frame dwell., for Richard Fisher, Washington St.; cost, $5,300.
Two-st'y frame dwell., for Chas. Burkhalter, Halsted St.; cost, $9,000.
Two-st'y frame dwell. and kindergarten school, for the Misses McKinnon, Winans St.; cost, $5,250.
Dwell., for C. P. Engelmann, first st'y of rock-face ashlar, Newark brown-stone, Arlington Ave.; cost, $16,000.
Two-st'y frame dwell., for Mrs. S. B. Bearse, Arlington Ave.; cost, $5,400.
Alterations to residence of Benj. Shepard; cost, $7,500.

Exeter, N. H.—A recent bequest of $50,000 to Phillips Exeter Academy will enable it to build a gymnasium.

Faribault, Minn. — Bishop Whipple has charge of $100,000 for building a Shumway Hall in the Shattuck School grounds.

Greely, Col. — Residence, brick, for B. D. Harper; cost, $8,000; C. A. Dunham, architect, Burlington, Iowa.

Hampden Sidney College (Prince Edward Co.), Va. — Messrs. J. A. & W. T. Wilson, architects, Baltimore, have prepared plans for a two-st'y and attic frame cottage, for Prof. Walter Blair; cost, $6,000; Wm. S. Smith & Bro., builders, Baltimore, Md.

Hot Springs, Ark.—Mr. York, two-st'y frame dwell.; Foster & Liebbe; architects; cost, $7,000.

Independence, Kan. — A new storeroom and dye-house is in process of construction by the Independence Woolen and Hosiery Mills; S. Sharp & Co.

Kansas City, Mo. — The largest building permit taken out during the present year was issued October 2, by the City Engineer, to Gen. S. M. Bowman, to erect a block of brick and stone buildings, 50′ x 280′, and five stories high, on Bluff St., 320′ northwest of the Bluff-street bridge, at a cost of $90,000. The contract has been executed, and the work of excavating for the foundation will be commenced forthwith. The ground floor will be used for store-rooms, while the rest of the building will be divided into flats.

W. C. Oburn, a brick business-building, 1316 and 1318 West Eighth St., two-st'y; cost, $10,000.

Abernathy Furniture Company, addition to warehouse, cor. Ninth and Liberty Sts., 45′ x 70′, and three stories high; cost, $9,000.

Topeka & Santa Fe Railroad, to rebuild freight-depot, cor. of Hickory and Joy Sts.; cost, $50,000.

Downs & Cowherd, brick business-building, cor. Twelfth and Walnut Sts., 116′ x 386′, three stories high; cost, $10,000.

Kearny, Neb.—Dwell., for C. B. Finch; cost, $5,000; C. A. Dunham, architect, Burlington, Iowa.

Keokuk, Iowa. — School-house, brick; cost, $10,000.
Dwell., for A. H. Evans; cost, $6,000.
Dwell., for L. D. Sheppard; cost, $5,500.
Dwell., for John D. Perkins; cost, $4,600.
Dwell., for Chas. Pond; cost, $6,000.
C. A. Dunham, architect, Burlington, Iowa.

Knoxville, Io.—Frame church; Foster & Liebbe, architects; cost, $4,500.

Lake City, Io.—School-building, two-st'y brick; Foster & Liebbe, architects; cost, $8,000.

Lefflers, Iowa. — Chapel, Congregational; cost, $3,000; C. A. Dunham, architect, Burlington, Iowa.

Lockport, N. Y. — W. E. Huston, wood dwell.; cost, $5,000; D. S. Hopkins, Grand Rapids, Mich., architect.

Los Angeles, Cal. — Ellis Villa College, a Presbyterian boarding-school for ladies, 2 wings, 42′ x 100′ each, three-st'y; heated with hot water, and lighted with electricity; cost, $27,000.

University of South California; built by M. E. Church, 100′ x 100′, brick, three-st'y and basement, hot-water heating; cost, $40,000.

Two-st'y brick engine-house for city; cost, $5,000.

Business block for Mott & Spence, 6 stores, three-st'y; cost, $22,000; Boring & Haas are architects of all the above buildings.

Marshalltown, Io. — Col. Bowler, Queen Anne dwell., two-st'y; Foster & Liebbe, architects; cost, $6,000.

Mazeppa, Minn.—E. B. Raymond, wood dwell.; cost, $3,000; D. S. Hopkins, Grand Rapids, Mich., architect.

Minneapolis, Minn. — Clark & Withers, two-st'y wooden store and tenement, 40′ x 60′, s s Hennepin Ave., bet. Fifteenth and Sixteenth Sts.; cost, $4,000.

Mr. Van Dusen, two-st'y wooden dwell., n e cor. Spruce and Seventeenth Sts., s; cost, $3,000.

F. B. Long, two-st'y addition and alteration of seven-st'y stone building, cor. Hennepin Ave. and Fourth St.; cost, $25,000.

L. L. Stanchfield, alteration skating-rink, Eleventh St., cor. South Fourth Ave.; cost, $3,000.

Mrs. M. Fairchild, two-st'y wooden double tenement-building, South Third Ave., between Ninth and Tenth Sts.; cost, $6,000.

M. H. Crittenden, two-st'y wooden dwell. and one-and-one-half-st'y barn, n s Nineteenth St., at head of Spruce St.; cost, $5,600.

C. A. Anderson, two-st'y brick veneer dwell., Twenty-first Ave., between Franklin and Twenty-second Sts.; cost, $3,000.

C. A. Anderson, two-st'y double brick veneer dwell., same location; cost, $3,000.

Second Congregational Society, chapel, wood and brick, n s Franklin Ave., between Park and Portland Aves.; cost, $3,500.

Thomas Downs, two-st'y frame dwell., e s Portland Ave., between Twenty-second and Twenty-fourth Sts.; cost, $3,000.

J. H. Bamhold, 3 two-st'y frame dwells., e s Portland Ave., between Twenty-fifth and Twenty-sixth Sts.; cost, $5,000.

L. F. Menage, 16 frame houses, Menage's fifth and Jennett's additions; cost, $17,450.

L. F. Menage, Sixth Ave., between Eighth and Ninth St., three-st'y brick flat; cost, $10,000.

L. F. Menage, Eleventh St., between Sixth and Eighth Aves., north, double three-st'y brick store and flat; cost, $9,000.

S. E. Foster, alteration of store-building to hotel, n e cor. North First Ave. and Third St.; cost, $3,000.

T. B. Casey, two-st'y brick-veneered dwell., s cor. Tenth Ave. and South Sixth St.; cost, $25,000.

W. J. Warren, basement of a three-st'y quadruple brick store and dwell., w s North Washington Ave., between Seventh and Eighth Aves.; cost, $3,000.

Monmouth, Ill. — Cottage for Frank M. Wier; cost, $3,400; C. A. Dunham, architect, Burlington, Iowa.

Montclair, N. J. — Kindergarten school, for the Misses Seymour; cost, $3,500; S. W. Whittemore, architect, Brick Church, N. J.

Narragansett Pier, R. I. — House; owner, H. E. Sanford, Esq.; architect, J. M. Merrick, New York; cost, $20,000.

Newport, R. I. — A three-st'y villa, 60′ x 122′, is to be built on Beach St., for Mr. Wm. Edgar, to cost about $30,000, from designs of Messrs. McKim, Mead & White, of New York; and from plans of the same architects a brick and stone villa and stable are to be built at a cost of $40,000, for Mr. Henry A. C. Taylor.

Plymouth, Mass. — The Plymouth Methodists laid the corner-stone of their new $20,000 church, October 4, with elaborate ceremonies.

WE OFFER

New Subscribers to the Weekly Edition of the

American Architect and Building News

THE FOLLOWING

SPECIAL INDUCEMENTS.

I. *New* subscribers who pay their subscriptions for 1885 in full ($6.00) before December 25, 1884, will receive, FREE OF CHARGE, the copies issued in November and December, 1884.

II. A limited number of new subscribers for 1885 can obtain also the unbound volume for 1884 at a *combination price* of $10.50 (regular price, $13.50).

CANVASSERS WANTED.

To compete for the

Cash Prizes

We offer for the largest lists of New Subscribers

TO THE

American Architect and Building News.

$500. — $150. — $100.

Send for Circulars, etc., to

JAMES R. OSGOOD & CO., 211 Tremont St., Boston.

Publishers' Department.

The American Architect and Building News.

PUBLISHED EVERY SATURDAY BY

JAMES R. OSGOOD & COMPANY,

211 Tremont Street, Boston, Mass.

Branch Office, 658 Broadway, New York.

15 cents per copy; $6.00 per year; six months, $3.50; 12 Monthly Numbers, $1.75.

☞ Payment should be made *directly* to the publishers, either by draft or post-office order.

NOTICE.

By a printer's error the address of Messrs. Malone & Co., a new advertisement in our last issue, was given as Cincinnati, instead of Cleveland.

FOR SALE.

LOT. 50′ x 100′, on Howard St., Cambridge, Mass.: price, 60 cents per foot. Inquire of I. J. Knapp, *American Architect* office, 211 Tremont St., Boston, Mass.

WANTED.

ENGINEER DRAUGHTSMAN. — Wanted, a competent young engineer and draughtsman, to work at measuring and drawing iron-work details. Manly & Cooper M'f'g Co., Forty-second St. and Euclid Ave., Philadelphia, Pa. 463

FOR SALE.

STEAM DERRICKS. — For sale, at the works of Wm. Struthers & Sons, n w cor. Twenty-fourth and Walnut Sts., Philadelphia, two overhead steam derricks, with false works and rail. Frames and rippers of Merriman's patent, including steam engine and boiler, with pump; also pulleys and shafting connected with saws. Steam crane on end of wharf. All the above machinery in very good order. Can be removed from the premises on or about the middle of January, 1885. Tools and other utensils connected with the marble work sincluded. Apply at the office of the firm, n w cor. Twenty-fourth and Walnut Sts., Philadelphia, Pa.

H.W.JOHNS'
ASBESTOS
LIQUID PAINTS

Are the purest, finest, richest, most durable and economical paints ever made for structural purposes. Samples of colors and Descriptive Price List free by mail.

From American Agriculturist, November 1880.

"We can gladly refer the reader to our recommendations of this firm and its paints in the past."

Send for Copy of our Pamphlet,

"STRUCTURAL DECORATION,"

with illustrations of prominent buildings and other structures painted with our paints.

Roof, Car, and Bridge Paints.

In seven colors. Are especially adapted for out-buildings, barns, fences, and for iron and rough woodwork.

STRICTLY PURE COLORS

For the use of Artists, Decorators, and Painters. Are ground in refined Calcutta Linseed Oil, to a fineness not excelled by the best imported artist or "tube" colors to which they are fully equal in depth and brilliancy of color.

ASBESTOS ROOFING.

The best in the market. Suitable for steep or flat roofs in all climates. Easily applied by any one.

ASBESTOS BUILDING FELT.

For interlining frame buildings, floors, etc. It is wind, dust, and strictly fire-proof.

Send for Full Descriptive Catalogue, Samples, etc.

H. W. JOHNS' Manufacturing Company,

No. 87 MAIDEN LANE, NEW YORK.

Sole Manufacturers of Genuine Asbestos Liquid Paints, Roofing, Steam-Pipe and Boiler Coverings Piston and Packing, Millboard, Fire-Proof Paints, Cements, Coatings, etc.

BUILDING INTELLIGENCE.

Red Bank, N. J.—Buildings for new water works, to be built from plans by Wilson Bros. & Co., architects, Philadelphia, Pa.

Rochester, N. Y. — Work has just been commenced on a large commercial building on North St. Paul St., to be completed February 1st. Brick, terra-cotta and Ohio stone trimmings, five-st'y, 75′ front; John Straughen & Son, masons; Robinson Bros., carpenters; Mr. L. P. Rogers, architect.

Mr. Charles Briggs is to build a block of dwelling houses, cor. of Lake Ave. and Perkins St., three-st'y, 66′ on Lake Ave., 165′ on Perkins St.

Work has been commenced on dwelling house, cor. Park Ave., and Goodman St., for Mr. A. J. Hatch; cost, $8,000; Laur & Co., contractors; Warner & Brockett, architects.

Seabright, N. J. — House for J. N. Ewell, Esq., of New York; cost, $10,500; contractor, H. C. Livezey; architect, Edward L. Woodruff.

Two-st'y frame dwell., for Charles Strong, Prospect St.; cost, $5,390; S. W. Whittemore, architect, Brick Church, N. J.

South Orange, N. J. — A two-st'y stone and frame cottage, to cost $6,000, is to be built for Mr. Shaen, from plans of Messrs. Rossiter & Wright, of New York.

Staten Island, N. Y. — At New Brighton, annex-building, for Brighton Heights Seminary; cost, $6,000; architect, Edward L. Woodruff.

Vineland, N. J.—Cottage for H. Scott Houel; cost, $7,000; C. A. Dunham, architect, Burlington, Iowa.

Watertown, Dak. — Hotel, brick; cost, $35,000; C. A. Dunham, architect, Burlington, Iowa.

Bids and Contracts.

Pawtucket, R. I.—The bids for the work on the new school-house, in accordance with certain changes made in the specifications since the meeting on September 29th, are as follows: —

For the mason work —Patrick Farrell, $8,690; H. Tinkham, $8,590; James L. Bryant, $7,972.

For the carpenter work, Northrup & Young, $8,738; French, Mackenzie & Co., $8,500.

For the complete building — Whitaker & Smith, $14,942.

The committee voted to accept the revised plans and specifications, and to accept the bid of Messrs. Whitaker & Smith for building the schoolhouse.

Baltimore, Md.—The contract for stone carving on the post-office, etc., has been awarded to John Munroe, of Baltimore, at his bid of $28,523.

Boston, Mass.—The Committee on Public Buildings has awarded the contract for freestone for the Minot Grammar School-house to Jeremiah Carew, for $2,377; cut granite to Timothy Shea, for $617; and masonry to J. H. Coon, for $15,988. The bids for masonry ranged from $15,988 to $21,949.

PROPOSALS.

CITY-HALL.

[At Richmond, Va.]

City Engineer's Office,
Richmond, Va., October 15, 1884.

Sealed proposals are invited **until December 1st, at 12 o'clock,** M., for building a new city-hall at Richmond, Va.

Drawings, specifications, and printed forms can be seen at this office.

The Committee on Grounds and Buildings reserves the right to reject any and all bids.

For further information apply to the undersigned.

466 W. E. CUTSHAW, City Engineer.

MARBLE TILING.

[At Kansas City, Mo.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 o'clock,** P. M., **on the 22d of November, 1884,** for furnishing and laying all the marble tiling required in the custom-house and post-office building at Kansas City, Mo., in accordance with the drawings and specification, copies of which and any additional information may be obtained on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,

464 Supervising Architect.

COURT-HOUSE FRONT.

[At Woodstock, Va.]

Sealed proposals will be received at the office of the Clerk of the County Court of Shenandoah County, **until Monday, November 24, 1884, 10 o'clock,** A.M., for furnishing the materials and performing the necessary labor for the erection of a court-house front at Woodstock, Va.

The building to be of brick, with stone facing, 40′ x 75′, two-st'y, with mansard roof and tower, with the clerk's offices (Circuit and County) on the lower floor fire-proof.

Plans and specifications may be seen at the County Clerk's Office, or at the office of T. F. Schneider, Architect, 933 F St., n w Washington, D. C.

Each bid must state the time required for the completion of the building, and a proper bond will also be required of the person who is awarded the contract.

The Board of Supervisors reserve the right to reject any and all bids.

By order of the Board. L. S. WALKER,

464 Clerk Board Supervisors Shen. Co. Va.

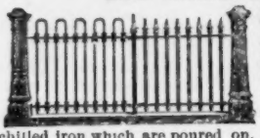
THE PERMANENT
EXHIBIT & EXCHANGE
Of Building Materials and Improvements.
Open free to the Public every business day of the year.
N. E. cor. Wabash Av. and Washington St., CHICAGO.

Architects and visitors interested in building, from all parts of the country, are particularly invited to make this establishment their headquarters. Information and assistance will be extended to them, and use of writing and reading rooms gratis.

Visitors' Correspondence may be addressed in care of this establishment.

HENRY LORD GAY, Proprietor. T. S. HOTCHKISS, Manager.

This Illustration



represents two of our patterns of Composite Iron-Railings. The upright, as well as the parallel bars, are continuous, and are joined by ornaments of chilled iron which are poured on, making a perfect panel without a joint. We have over one hundred different designs in this style of work and our prices are as low as the same quality of work in wrought or cast iron, but our Composite process is better than either. Gates and window-guards made in this way are the best in the world. We also make all kinds of iron-work from architects' designs.

COMPOSITE IRON WORKS CO.,
83 Reade St., New York.

Sidewalk
— AND —
VAULT
LIGHTS.

Sole Manufacturers of the

FLOOR and ROOF
LIGHTS.

Ross Patent Light.

DAUCHY & CO.,
125 & 127 Indiana St., (near Wells),
CHICAGO, ILL.

PROPOSALS.

STONE AND BRICK WORK.

[At Dallas, Tex.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 18th day of November, 1884,** for all the labor and materials, stone, brick, mortar, etc., and building complete the basement and area walls of the court-house, post-office, etc., building at Dallas, Texas, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after time of opening, will not be considered. M. E. BELL,

464 Supervising Architect.

BREAKWATER.

[Delaware Bay.]

U. S. Engineer Office, 1125 Girard Street,
Philadelphia, Pa., October 16, 1884.

Sealed proposals, in triplicate, will be received at this office **until 12 o'clock,** M., **of Saturday, November 15, 1884,** and opened immediately thereafter, for 23,000 tons of stone, more or less, to be used in the construction of the Delaware Breakwater Harbor.

For blank forms, specifications, etc., apply at this office. W. H. HEUER,

463 Major of Engineers, U. S. Army

STONE AND BRICK WORK.

[At Jefferson City, Mo.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., November 1, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 18th day of November, 1884,** for all the labor and material, stone, brick, mortar, etc., and building complete the basement walls of the court-house, post-office, etc., building at Jefferson City, Mo., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening, will not be considered. M. E. BELL,

464 Supervising Architect.

SAFES AND VAULTS.

[At Washington, D. C.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., October 23, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 25th day of November, 1884,** for supplying the burglar-proof safes and chests, fire and burglar safes combined, fire-proof safes, fire-proof doors, shell safes, and single and double steel-lined vault-work required by the Treasury Department, and as may be ordered during the fiscal year ending June 30, 1885, in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, on and after November 5, 1884.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,

464 Supervising Architect.

IRON WORKS.

[At St. Louis, Mo.]

Office of Supervising Architect,
Treasury Department,
Washington, D. C., October 24, 1884.

Sealed proposals will be received at this office **until 2 P. M., on the 8th day of November, 1884,** for furnishing and fixing in place complete the cast-iron ornamental panels for area railing around the custom-house and post-office building at St. Louis, Mo., in accordance with drawing and specification, copies of which may be seen and any addititional information obtained on application at this office, or the office of the custodian at the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,

464 Supervising Architect.

No. 481, Illuminating Tile.

W. P. SUMNER, Pres. W. H. GORDON, Supt. F. R. MINCKLER, Sec'y.

NATIONAL WIRE & IRON CO.,

DETROIT, MICHIGAN,

MANUFACTURERS,

Fire-Proof Wire Lathing,

FIRE-ESCAPES,

Balconies, Iron Shutters, Iron Sash, Stable Fittings,

WEATHER VANES, Etc.

Catalogue mailed free on application.

No. 469, Iron Stair and Balcony Railing.

No. 477. Iron Shutters.

No. 479, Iron Sash.

NEW EDITIONS OF

The Best Art-Books.

The First of May:

A Fairy Masque. Presented in a series of fifty-two designs (exclusive of ornamental Titles, Dedication, etc.), by WALTER CRANE; reproduced, with absolute faithfulness and exquisite delicacy, by the Heliotype Process, from the first imported copy of the London ten-guinea edition. One vol. Oblong Folio. $2.50.

An extract from the London Publishers' Circular:—

"No description which we could here give would realize the variety of the subjects and the wide range of Mr. Crane's pencil. We may, however, be permitted to call attention to the felicity with which each of the characters, human and semi-human, are drawn and individualized. Men, women, boys, girls, fairies, demons, elves, imps, beasts, birds, and even insects, all figure before us—singing, dancing, flying, joyous or sad, in each scene of the masque. All is May and Fairyland.

"Poetry and fancy, pathos and humor, meet us on every page. The whole of these scenes, too, are presented either in varied landscapes of country, forest, or river scenery or else in frescoes and arabesques of exquisite beauty. In this his latest and greatest work, Mr Crane has developed new powers. We have reason to believe that public opinion will pronounce this to be his *chef-d'œuvre*."

A Hand-book of Legendary and Mythological Art.

By CLARA ERSKINE CLEMENT. Profusely illustrated, and with a complete index. Fourteenth edition, revised and enlarged. Crown 8vo. Cloth, $3.

Painters, Sculptors, Architects, Engravers, and their works.

A Hand-book, with many illustrations and monograms. By CLARA ERSKINE CLEMENT. Seventh edition, revised and enlarged. Crown 8vo, $3.

JAMES R. OSGOOD, & CO 211 Tremont St., BOSTON.

Guaranteed Roofing Plates.

GILBERTSON'S OLD METHOD.

We guarantee ***Gilbertson's Old Method*** to be an extra coated plate, and to contain ***36 lbs.*** of metal to a box of IC 20 x 28 and ***18 lbs.*** to IC 14 x 20.

To be a heavier coated plate than M. F., or Old Style, and if not found so, all boxes to be held subject to our order.

That the quality of material is equal to any plate ever made.

That our prices are lower than the fancy prices heretofore demanded for extra coated plates.

CAMARET ROOFING.

Guaranteed to stand any test in bending. Can be hammered down and flat again without breaking.

Every sheet in a box to be well coated, well selected, and great attention given to squaring sheets.

To be coated with Palm Oil that will keep it from rusting longer, if not painted, than ordinary plates.

Our prices are very low for this splendid plate, so any one desiring can use a first class plate at a moderate price.

Write for Prices. Order a Sample Box.

MERCHANT & CO.,

525 Arch St., PHILADELPHIA. 90 Beekman St., NEW YORK.

"BUILDING SUPERINTENDENCE."

The best and latest treatise on American practice in building.

Clear, readable, reliable and complete. ***Price, $3.00.***

For Sale by all Booksellers.

JAMES R. OSGOOD & CO. Publishers, 211 Tremont St., Boston.

SOAPSTONE FINISH.

Superior to Plaster or Sand Finish, for Walls and Ceilings. Send for Circular.

AMERICAN SOAPSTONE FINISH COMPANY,

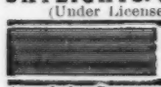
P. O. BOX 35, PROVIDENCE, R. I.

Roofing Materials.

NEW ENGLAND
Felt Roofing Co.
22 Milk St., Boston.
Originators of Felt Roofing in New England.
Inventors and only Manufacturers of the Celebrated
"BEEHIVE BRAND."

KNISELY & MILLER
129 and 131 South Clinton St., Chicago,
(Send for Illustrated Catalogue.)
Slate, Tin & Iron Roofers.

MANUFACTURERS OF
GALVANIZED IRON CORNICES.
THE HAYES PATENT SKYLIGHTS.
(Under License.)



CORRUGATED IRON FOR ROOFING, &c.
Austin's Corrugated Expanding Conductor Pipe.

STORY & WILBUR,
Formerly A. WILBUR & Co. (Established 1821.
EMPORIUM FOR
ROOFING SLATES
We have the entire production of
MERRILL'S
BROWNVILLE (MAINE) SLATE
ALSO THE
MONSON (MAINE) SLATE,
Both of which are Black and Unfading and the standard Slate of the market. Used by all Boston architects for first-class buildings, and the cheapest slate in the market for the quality. Also,
WELSH, BANGOR PENNSYLVANIA, STAR PENNSYLVANIA, BLACK DIAMOND PURPLE and GREEN SLATES
Roofing-Tin, Zinc, Solder, Nails, Elastic Cement, Rozin-Sized, Tarred and Dry Felts.
RED SLATES.
Our stock of Slates embraces over 20,000 squares, of all grades and prices. Particular attention to shipments by vessel or rail, for export or home trade.
Special rates by car-loads from quarries.
Inquiries promptly answered.
Slate Wharves, 529 Commercial St.,
JOSEPH STORY. BOSTON. S. A. WILBUR.

T. F. & J. A. HAYDEN,
WHOLESALE DEALERS IN
ROOFING SLATE
Cor. Twelfth and Locust Sts. St. Louis, Mo.

THE CINCINNATI
CORRUGATING COMPANY,
CINCINNATI, OHIO.
Superior Iron Roofing, Siding, Ceiling, Arches. Most Economical, Durable and Effective.
Send for our Illustrated Catalogue.

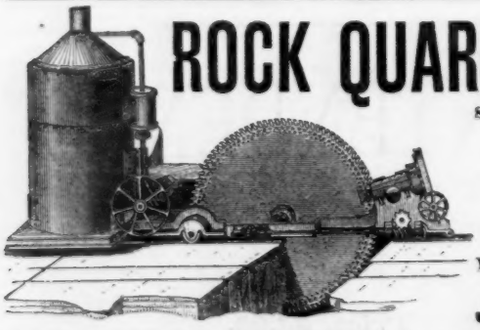
EUREKA SLATE CO.
Manufacturers and Dealers in
THE ONLY PURE UNFADING GREEN ROOFING SLATE.
PURPLE, SEA GREEN, RED, and BLACK SLATES.
Also Billiards, Paving Slabs, Mantels, Urinals and all Kinds of Slate Works.
Eureka Slate Quarries, Poultney, Vt.
Outer Temple Building,
Strand, London, England.
Send for Price List.

GRANITE ROOFING.
(PATENTED.)
For steep or flat roofs, Felt and Burlap combined and granitized; a finished roofing, easy to lay; Strong, elastic, durable and cheap. Best roof for Iron-works. Acids and sulphur have no effect on it. Send for circular and sample.
THE GRANITE ROOFING CO.,
15th and Washington Ave., PHILADELPHIA.

H. F. WATSON,
Manufacturer of
BUILDING PAPERS,
ROOFING MATERIALS, ETC.
Deafening Felt, Water-Proof Sheathing, Packing Paper, etc. Mills at Erie & Fairview, Pa.
Price List and Sample book furnished upon application. Lowest rates of freight to all points.

The Bodine Patent Roofing: *THE Best Roofing in the World.*
EXCLUSIVE SALE GIVEN TO ONE PARTY ONLY IN A TOWN. *Lumber Dealers, Hardware Dealers, Architects, Contractors and Builders, also those about to build, write for sample and price to* *The Bodine Roofing Company, Mansfield, O.*

ROCK QUARRIER CUTS STONE AS IT LIES, NATURAL IN THE EARTH, TO ANY SIZE WANTED.



Saves waste of Stone, handling waste, and powder. Cuts 32 inches deep, 150 feet length according to hardness of rock. Cuts and finishes the block as it lies natural in the earth.

NORTH PEACH BOTTOM ROOFING SLATES WARRANTED
Warranted superior in quality. Color, blue-black, never fades. Does not drop from the nail.
JOHN CRUMP, 4 So. Broad St. Philadelphia.

MODERN PERSPECTIVE,
A Treatise upon the Principles and Practise of
PLAIN AND CYLINDRICAL PERSPECTIVES.
By Prof. Wm. R. Ware, Price, $5.00.
JAMES R. OSGOOD & CO., Publishers, 211 Tremont St., Boston.

Iron-Work.

J.B.&J.M.CORNELL,

MANUFACTURERS OF

IRON

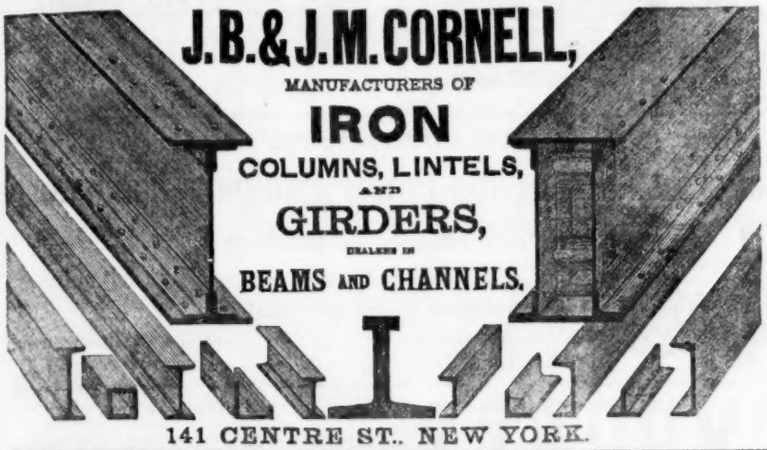
COLUMNS, LINTELS,

AND

GIRDERS,

DEALERS IN

BEAMS AND CHANNELS.



141 CENTRE ST., NEW YORK.

JOHN MERRY, Manufacturer of the

"LION" and "PHŒNIX" BRANDS of GALVANIZED SHEET-IRON.

And dealer in all grades of black Sheet-iron. Corrugated-iron for Roofing or Siding, Tin Plates, Solder, Sheet Zinc, Slating and Roofing Nails, Tinned, Galvanized and Blocked. All kinds of iron work galvanized or tinned to order.

537 to 547 West 15th Street, NEW YORK.

McHOSE & LYON, Dayton, Ohio,

ARCHITECTURAL IRON WORKS.

IRON FRONTS FOR BUILDINGS,

Columns, Girders, Wrought-Iron Fencing, Wrought-Iron Bridges, Iron Stairs. All kinds of Iron-Work used in Buildings. Grey Iron Steam-Fittings.

Designs and Estimates furnished on application.

THE SNEAD & CO.

IRON WORKS,

Louisville, Ky.

Manufacturers of every description of

Structural and Ornamental Iron Work.

Iron Buildings,	Store Fronts,
Iron Roofs,	Riveted Girders,
Jail-Work,	Bank-Vaults,
Columns,	Stairways,
Railings,	Gates,
Verandas,	Crestings,
Skylights,	Sash-weights,
Air-Grates,	Bolts,
Sidewalk-lights,	Blacksmithing.

Contracts taken in any part of the country.

UNION FOUNDRY,

AND PULLMAN CAR-WHEEL WORKS.

Architectural Iron-Work a Specialty.

Dealers in Beams, Channels, Angles, and Shapes, both Iron and Steel. Correspondence solicited and prices given on all classes of Iron-Work.

Established 1852. Office, 164 Dearborn St.,

N. S. BOUTON, Pres't., CHICAGO.

Passaic Rolling Mill Co.

PATERSON, N. J.

SOLID ROLLED BEAMS,

Channels, Angles, Tees and Merchant Iron.

New York Office, Room 45, Astor House.

SAMUEL J. CRESWELL,

IRON WORKS,

Twenty-third and Cherry Streets,

PHILADELPHIA, PENN.

Fronts for Buildings, Columns, Girders, Wrought-Iron Beams, Sidewalk Lights, Drinking-Fountains, Garden Vases, Stairs, Crestings, Stable Fixtures, Lamp-Posts, Railings

NORTHROP'S

PATENT PANELED IRON CEILING.

DURABLE, HANDSOME AND FIRE-PROOF.

Will not stain or crack off as plaster, or warp and burn as wood.

NORTHROP'S PAT. CAP-SEAM IRON ROOFING. Over 3,500,000 square feet used in the past ten years. Suitable for all classes of buildings. Is never out of repair. Address,

A. NORTHROP & Co., 97 1st AVE., PITTSBURGH, PA.

J. S. THORN,

ARCHITECTURAL

GALVANIZED IRON

and ORNAMENTAL CAST-ZINC WORKS.

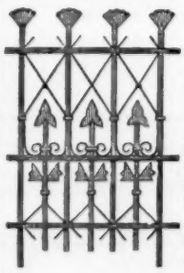
Hayes Patent Ventilating Skylights (under license). Floor Lights, Vault Lights, Building Specialties and Builders' Light Iron-Work of every description.

Nos. 1201, 1203, 1205, 1207, 1209 Callowhill St., PHILADELPHIA, PA.

DAVID PETTIT & CO.,

1130 and 1132 Ridge Avenue,

PHILADELPHIA, PA.



Manufacturers of

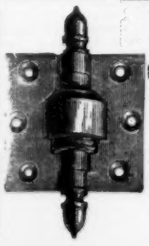
—PATENT—

Wrought Iron Fences

For Public and Private Buildings and Cemetery Lots. Also Galvanized Tubing, Gates, Ornaments, Settees, Chairs, Vases, etc. for cemetery lot enclosures.

Old stand of

ROBERT WOOD & CO.



Union Spring Hinges

ARE

SIMPLE, EASILY SET,

CANNOT BE PUT ON WRONG.

They work either way, right or left. All sizes. Single or double acting.

For Wire Screens or Light Doors, they have no equal.

Send for Price List.

M. W. ROBINSON, Sole Agent, 79 Chambers St., New York

J. G. & T. DIMOND,

Architectural Iron - Works.

ESTABLISHED 1852.

209 & 211 West 33d St., New York.

IRON

BUILDINGS,

ROOFS, FRONTS,

BEAMS, GIRDERS,

STAIRS, COLUMNS,

RAILINGS, etc., etc.

Special attention given to ornamental Wrought-Iron Work.

THE

PHŒNIX IRON COMPANY,

410 Walnut St., Philadelphia, Pa.

Manufacture Rolled Beams, Channels Angles, Tee, Shape and Bar Iron of all sizes.

Roof Trusses, Girders, and Joists for fire-proof buildings framed and fitted as per plans.

PHŒNIX Wrought-Iron Columns of all sizes.

Die-forged Weldless Eyebars a specialty Designs and estimates furnished.

Boston Agents, FRED. A. HOUDLETTE & Co., 272 Franklin Street.

New York Agents, MILLIKEN & SMITH, 95 Liberty Street.

CHENEY & HEWLETT,

Architectural Iron Works.

Wrought and Cast Iron Work for Building Purposes.

N. CHENEY. C. HEWLETT. } OFFICE: { 201 BROADWAY, New York.

Works: Greenport, L. I.

WALLIS IRON WORKS.

Manufacturers of the

PERKINS PATENT

Fire-Proof Double Iron Shutters & Doors

For Stores and Warehouses.

Tested and recommended by underwriters throughout the United States. Catalogue with reports of tests mailed on application.

7 to 11 Morris St., Jersey City, N. J.

Rolled and Drawn Steel Hand Rail, in 20 Feet Lengths.

Ornamental Iron Works.

MANLY & COOPER MANUF'G CO.

ELM AVENUE AND 42d STS., PHILADELPHIA.

BRIDGE RAILINGS

JAIL AND BANK WORK

GRILLS, ANDIRONS

SHUTTERS, DOORS, &C.

Railings, Gates, &c. for Residences and Public Institutions.

Special facilities for the manufacture of FORGED *and* PLANED *Wrought Iron Work for Interior Decorations.* Send for Catalogue.

CARNEGIE BROS. & Co. LIMITED.

UNION IRON MILLS.

DEPARTMENT

BRANCH OFFICE, 33rd ST. PITTSBURGH, PA.

MANUFACTURERS OF

WROUGHT IRON BEAMS, CHANNELS, TEES, ANGLES,

STRUCTURAL & BRIDGE IRON.

LITHOGRAPH OF SECTIONS AND BOOK OF DETAILED INFORMATION FURNISHED ENGINEERS AND ARCHITECTS ON APPLICATION.

N.J. STEEL & IRON CO.
TRENTON, N.J.
ROLLED IRON BEAMS,
CHANNELS, ANGLES & TEES.
COOPER, HEWITT & CO.
NEW YORK.

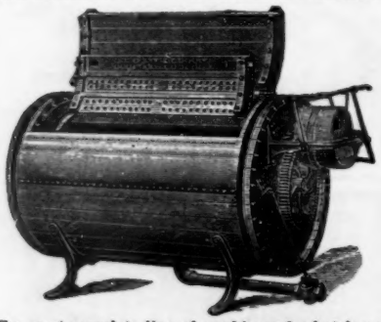
NATIONAL
Fine Art Foundry,
218 East 25th Street, New York.
ARTISTIC BRONZE DECORATION
for Buildings, Monuments, and Altars.
Architects' Designs executed, and designs furnished for special subjects.
Artistic Monuments in Granite and Bronze.

SETH THOMAS CLOCK CO.,
THOMASTON, CONN.,
20 MURRAY ST., NEW YORK.
TOWER CLOCKS.
SEND FOR CATALOGUE.

THE E. HOWARD
WATCH AND CLOCK COMPANY.
CLOCKS
OF ALL KINDS.
TOWER CLOCKS A SPECIALTY.
114 Tremont St., Boston. 2 Maiden Lane, New York.

Kissena Nurseries.
Trees and Plants
Parsons & Sons Co.,
LIMITED
Flushing, N. Y.

Troy Laundry Machinery Co.,
LIMITED. TROY, N. Y.
Salesrooms: New York and Chicago.



The most complete line of machinery for hotels and Public Institutions. Complete laundries for Institutions our specialty.
Estimates furnished. Send for Illustrated Catalogue.

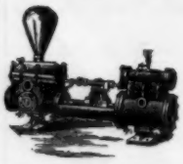
Jean-Francois Millet: Peasant and Painter.
Translated by Helena de Kay, from the French of Alfred Sensier. With a portrait of Millet, and numerous illustrations from his works. Square octavo. Price, $3.
JAMES R. OSGOOD & CO.,
211 Tremont Street, Boston, Mass.

McSHANE BELL FOUNDRY

Manufacture those celebrated Bells and Chimes for Churches, Tower Clocks, &c., &c. Prices and Catalogues sent free.
Address
H. McSHANE and CO.,
Baltimore, - - - Md.

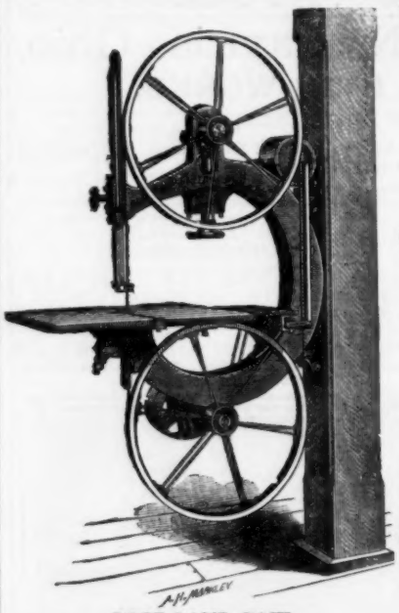
BUCKEYE BELL FOUNDRY.
Bells of Pure Copper and Tin for Churches, Schools, Fire Alarms, Farms, etc. FULLY WARRANTED. Catalogue sent Free.
VANDUZEN & TIFT, Cincinnati, O.

GEO. F. BLAKE MANUFACTURING CO.
Makers of Steam and Power Pumping Machinery



For Public and Private Buildings
and Manufacturing Establishments.
For New Illustrated Catalogue, Address
44 Washington Street, BOSTON.
95 and 97 Liberty Street, NEW YORK.

CYPRESS
LUMBER
Of all Descriptions.
Dimension Shingles of Cypress.
Enquiries from Architects and Builders solicited
The A. T. STEARNS LUMBER CO.,
BOSTON, MASS.

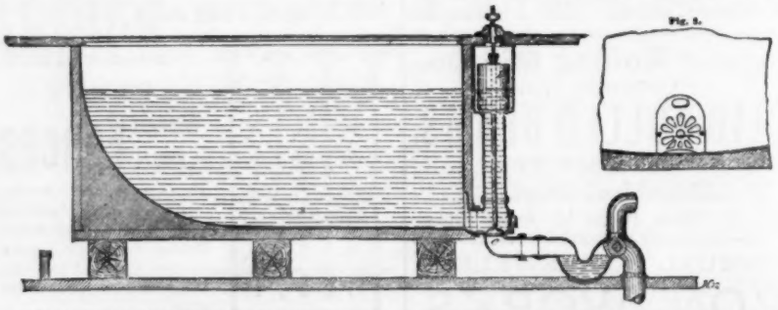


POST BAND-SAW.

Wood-Working
Machinery.
FOR
CAR BUILDERS,
PLANING MILLS,
RAILROAD SHOPS,
CABINET, CARRIAGE,
SASH, DOOR, and
BLIND MAKERS.
Send for Circulars.
GOODELL & WATERS,
Thirty-First and Chestnut Sts.,
PHILADELPHIA, PA.

Sanitary Supplies.

C. H. MOORE'S PATENT BATH TUB VALVE and BATH TUB.



With the use of this Bath Valve the objectionable overflow pipe is not required, and the extreme end of the waste-pipe is closed with the solid brass valve C, thereby shutting out Sewer Gas to a certainty, and preventing the trap from becoming empty by syphonage or evaporation; and if water accumulates in the bath tub above the dotted lines shown, the float B lifts the valve C automatically, forming a channel for the surplus water to escape under the valve to the waste-pipe, which is much the safest plan as an overflow pipe either in a basin or bath tub is liable to become clogged, while the rest of the waste-pipe is free. The bath tub it will be observed, has the discharge outlet at the end instead of the bottom, which makes it handsomer in appearance than the old style, and decidedly more comfortable for use, and renders it convenient to place the waste pipe and trap connecting thereto above instead of beneath the floor and lead safe, which is now the universal custom. It will also be noticed the bath tub has an inclination from every part toward the valve C, so that every particle of water drains from it when the valve C is up and suspended by the pull that projects through the wood capping.

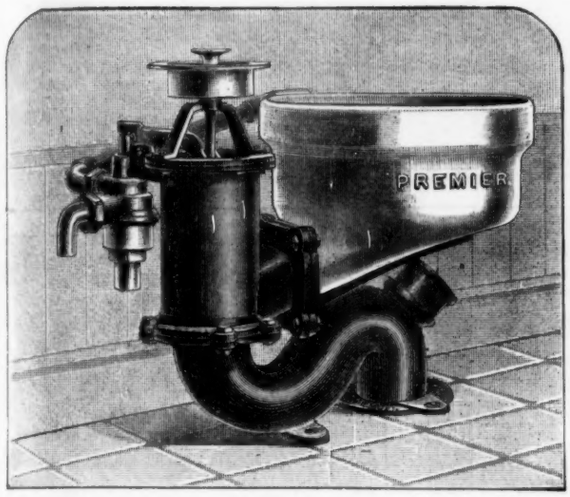
Fig. 2 shows the end of the bath tub and position of the strainer.

Manufactured by the WASHBURN & MOORE M'F'G. CO., Yonkers, N. Y.

N. B. — We furnish the tubs, if desired, fitted up complete with combination cock fed through the ordinary nozzle near the top of the tub or through a shield secured on the top of the end strainer. We also make Basin Valve and Water Closet on the same principle as the Bath Valve.

Sanitary Supplies.

DEMAREST'S PATENT
Side-outlet, Flushing-rim, Valve Water-Closet,
THE "PREMIER."



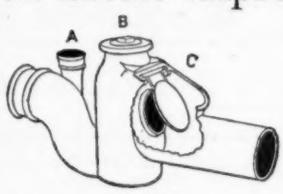
In calling the attention of our customers and all interested in fine Sanitary Work to the "Premier," we beg to say, that we have spared no expense to produce what we consider to be the very best Valve-Closet ever made. It is in all respects the same as our "Hygeia" Cistern-Closet, which is acknowledged to be superior to any cistern-closet in use, only it is fitted with a large valve (one-inch waterway) suited to all pressures, and which, under ordinary pressure charges the flushing-rim and flushes the closet almost, if not equal, to the wash of a cistern; this, heretofore, has been the great desideratum, namely: a valve that would be capable of supplying a flushing-rim bowl and thereby washing every part of same; moreover, this is accomplished almost entirely without noise; this we apprehend will be acknowledged by every one to be a most important feature, as we find many who object to the use of cisterns, not only on the ground of their being somewhat unsightly in the bath-room, but they dislike the noise caused by both the rush of water to the closet and the filling of the cistern, more particularly where the bath-room is in close proximity with drawing-rooms, or where it forms part of a suite. Regarding construction of the closet we have only to repeat that it is the same as our "Hygeia" and made with no idea of cheapness whatever, our object being to produce a strictly first-class article, not only from a sanitary point of view, but one that would be durable and efficient in every way. The valve and all its pipes and couplings are of heavy brass; in its construction it is of the simplest kind; very durable, working under all pressures, and can be readily understood and repared by any mechanic. The "Premier" is also furnished with the Patent Extension Cup, which so successfully does away with all trouble in fitting the cabinet-work.

Complete Illustrated Circulars with prices on application. All our Sanitary Specialties are fitted up with water attached and may be seen at our Warerooms.

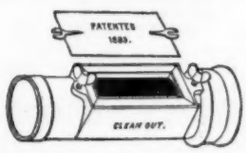
THE J. L. MOTT IRON WORKS,
88 and 90 BEEKMAN STREET, NEW YORK.

Barrett's Latest Improved Traps & Fittings.

Brass Trap, for Sink-Bowls, etc.



Iron Trap, For Sanitary and Back-water purposes.



Iron Clean-out, For Soil and Drain Pipe.

Brass Urinal Fitting.

The Superiority of Barrett's Improved Sanitary Traps over others now in use is: 1. Simplicity of construction. 2. It does not fill up and remain a filth cesspool. 3. It has a double seal. 4. Siphonage or evaporation has no effect on them. 5. It can be easily examined by removing trap screw. 6. All the working parts and screws are of brass. 7. There is nothing about them to get out of order. 8. It is the best constructed trap of the day. 9. It has a perfect seal without depending on water. 10. It is a sure preventive against sewer-gas and back-water. 11. It never fails to work. 12. It has all the improvements called for by the ordinances lately adopted by the various cities. 13. It is guaranteed to do all that is claimed for it.

Manufactured by

JAMES BARRETT,

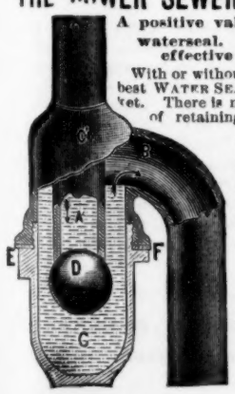
207 Tremont Street, Boston, Mass.

AGENCIES: Stambach & Love, Philadelphia, Pa.; Henry McShane & Co., Brooklyn, N. Y.; Henry McShane, Baltimore, Md.; Henry McShane, Washington, D. C.; Bailey, Farrell & Co., Pittsburgh, Pa.

Also for sale by William McShane, New York City.

☞ Send for Circular and Price List. ☜

THE BOWER SEWER-GAS TRAP.



A positive valve Seal; a sound waterseal. Simple, cheap, effective and durable.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL. None that approximates in it the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves in Traps, is little or no resistance to the outflow of water or waste. *Illustrative and descriptive 48-page pamphlet sent free on application.*

B. P. BOWER & CO.
Manufacturers,
CLEVELAND, O.

The Kelly Stop & Waste Cock

to prevent Water-pipes from freezing, and control the water-supply from any point in a building, or as a Self-closing Hopper Cock, or Self-acting Flushing Apparatus for Water-Closets or Urinals.

Send for Catalogue.

THOS. KELLY & BROS, Plumbers,
75 Jackson St., Chicago, Ill.
N. Y. Depot: RENTON BROS., 105 East Ninth St.

The Temporary Binder

Provided by us will keep your copies of the *American Architect* in PERFECTLY uninjured condition.

WEAVER'S PERFECTION

BASIN-WASTES

EXCEL ALL OTHERS

in the following points: "They leave the bowl free and clear." "They cut off all impurities of the vent-pipe." "They prevent clogging of strainers."

SIMPLE!
EFFECTIVE!
DURABLE!

They are exclusively used in the **White House**, at Washington, and the **Villard Residence**, N. Y. City.

Send for full descriptive circular to the manufacturer,

H. M. WEAVER - Mansfield, Ohio.

MYERS SANITARY DEPOT,
94 Beekman St., N. Y. City, Gen'l Eastern Agts.

Old Masters

OF BELGIUM AND HOLLAND. Translated by MRS. MARY E. ROBBINS, from the French of EUGENE FROMENTIN. 1 vol. 8vo. With 12 full-page Heliotypes. $3.

The Boston *Courier* says; "It is difficult adequately to convey a sense of the charm of this book."

The N. Y. *Star* says that "it lets the reader into the real life of the artists, into their surroundings, and even into their feelings."

JAMES R. OSGOOD & CO., Publishers,
211 Tremont Street, Boston.

Masons' Supplies.

AKRON SEWER PIPE CO., AKRON, OHIO.

MANUFACTURERS OF

STANDARD

Akron Salt-Glazed

SEWER PIPE

The superior quality of the pipe manufactured by this Company have given national reputation to Akron Sewer Pipe, which has been acquired solely by this Company's efforts to make the best article offered to the public. Be sure to order the Standard to secure the pipe which has made the reputation

Agencies for the sale of our Akron Pipe in all the Principal Cities of the United States.

New England Agents, FISKE & COLEMAN, 62 Congress Street, Boston, Mass.

For further information address F. W. ROCKWELL, Secretary, Akron, Ohio.

"The Best is the Cheapest"

For quality we refer by permission to the following eminent Civil Engineers

Mr. E. S. CHESBROUGH, *City Engineer, Chicago,*

Mr. J. W. ADAMS, *Sanitary Eng'r, Brooklyn, N. Y.*

Mr. J. HERBERT SHEDD, *Late Chief Eng'r Providence Water Works, Providence, R. I.*

Col. GEO. E. WARING, Jr. *Newport, R. I.*

Mr. W. H. BRADLEY, *Sup't Sewers, Boston, Mass.*

Mess. W. S. & ALF'D EGERTON, *Engineers in Charge of Parks, Albany, N. Y.*

Mr. W. W. WILSON, *Chief Engineer and Superintendent Yonkers Water Works, Yonkers, N. Y.*

Building Stones.

THOMLINSON & REED,
Quarrymen, and Dealers in

OOLITIC LIMESTONE

Quarries at Avoca, near Bedford, Ind.,
Branch Office:
Cor. Polk and Ellsworth Sts., Chicago.

MALONE & CO.,

Proprietors of the

Malone Blue-Stone Quarries,

Miners and Manufacturers of
SAWED AND BLOCK STONE.
Platforms up to thirty feet in length, for sidewalks, a specialty. **CLEVELAND, OHIO.**

BEDFORD OOLITIC LIMESTONE,

Buff and Blue.

HALLOWELL GRANITE CO.,
Quarrymen and Dealers in

Building, Sawed, and Rough

DIMENSION STONE.

P. O. Address - - - **Bedford Ind.**

Clark's Island Granite Quarries

OF ROCKLAND, ME.

Estimates given for **Building Dimensions** and **Monumental Work** in Granite, with extra facilities for dispatch and beauty of finish.

M. H. St. JOHN,
Owner and Proprietor.
Office: 83 and 84 Astor House, New York.

BRICKS!

THE HYDRAULIC

PRESS BRICK CO.

ST LOUIS, MO.

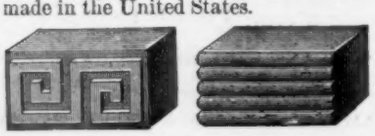
Make a Specialty of Ornamental & Plain

Red Front Pressed Brick,

Manufacturing Annually over

TEN MILLIONS.

They guarantee that the **quality, finish** and **Color,** are **unsurpassed, if not unequalled** by any other bricks made in the United States.



CHICAGO ANDERSON PRESSED BRICK CO.

157 Lasalle Street, CHICAGO, ILL.

FRONT & ORNAMENTAL Pressed Brick.

Best Brands of English and Continental

Portland Cements.

K. B. & S. English, Lafarge French,
Burham English, Lime of Teil,
Fewer German, Keene's Fine,
Jossan Antwerp, Keene's Coarse.

IMPORTED BY

JAMES BRAND, 85 BEEKMAN ST.,
NEW YORK.

GABRIEL & SCHALL,

205 Pearl Street, New York,
SOLE IMPORTERS OF
VORWOHLER ASPHALT MASTIC
OF BRUNSWICK (GERMANY).
VORWOHLER PORTLAND CEMENT, OF HOLZMINDEN (GERMANY).
IMPERIAL MORTAR AND CEMENT BLACK.

SINCLAIR & BABSON,

IMPORTERS OF

PORTLAND CEMENT,

105 John St., New York.

Brands, O. F. ALSEN & SONS, and K. B. & S.

Send for Practical Treatise on Cement.

STANDARD CEMENT CO.,

Manufacturers of

Hydraulic Cement And Hydraulic Lime.

E. G. WESTCOTT, Gen. Eastern Agt., Hartford, Ct.

Works at

Akron, N. Y. St. Louis, Mo. Mankato, Minn.

Dorchester, (New Brunswick.) FREESTONE. Yellow.

Corsehill, (Scotch.) FREESTONE. Red.

G. P. SHERWOOD. **24 Pine St., New York.**

TERRA-COTTA

CHIMNEY TOPS,

PHILADELPHIA AND PEERLESS (MOULDED) BRICK,

Akron Drain-Pipe. Portland, Roman, and Rosendale Cements. Hearth Tiles & Chimney Flue Lining.

WALDO BROS.,
88 Water Street, BOSTON.

PEERLESS BRICKS.

THE PEERLESS BRICK COMPANY

OF PHILADELPHIA,

MANUFACURES AND KEEPS IN STOCK

ARCHITECTURAL SHAPES, 300 KINDS.

ALSO

RED Pressed Fronts.
Extra fine in color and quality.

BUFF, Solid rich color,— beautiful.
One of the finest bricks made.

DRAB, Handsomer and more durable than stone.

BROWN, Very strong and superior to brown stone.

GRAY, A very desirable shade.

BLACK, Velvety jet face.
The only black brick fit for a fine building, producing a beautiful effect, and free from the glossy and greasy look of other black or dipped bricks.

DIAPERING and ORNAMENTAL
Bricks made in the above colors.

OFFICE:

1003 WALNUT STREET, Philadelphia.

SAMUEL HART, PRESIDENT. JOSEPH WOOD, Jr., TREASURER.

THE PEERLESS BRICK COMPANY

Wish to inform Architects and Dealers that no one is authorized to act as Agent for the sale of our manufactures.

Illustrated Catalogue and Price-List sent free on application.

WALPOLE MORTAR BLACK.

THE ORIGINAL.

The best in use and the only one that has stood the test of time. It improves the mortar, and is cheaper and better than Lampblack. Beware of imitations and use only the "Walpole."

HENRY D. DUPEE, Proprietor,
44 to 46 Oliver Street, Boston,

PROVIDENCE, R. I. Manchester & Hudson, Agents. NEW YORK. Candie & Smith, foot E. 26th St. Ag'ts

---

Winckelmann's History of Ancient Art.

Translated from the German by Dr. G. H. Lodge. Two volumes, 8vo. $9.00.

A new and cheaper edition of this unique classic with 75 fine copper-plate engravings. Winckelmann has been translated into five languages, as the most important work on ancient æsthetics, and the copious annotations of various German, Italian, and English critics are attached to the new Boston edition. The fine arts of ancient Greece and Italy are described with luminous precision, and with a multitude of details of fascinating interest.

"Winckelmann's style resembles an ancient work of art. Each thought steps forth, fashioned in all its parts, and stands there, noble, simple, lofty, complete: IT IS."—*Herder.*

PUBLISHED BY

JAMES R. OSGOOD & COMPANY,

211 Tremont St., Boston, Mass.

Fire-proof Building.

THE WIGHT FIRE-PROOFING COMPANY,

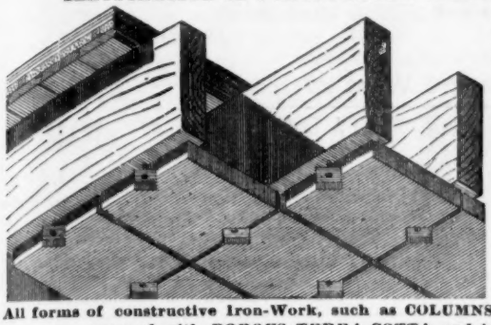
202 La Salle St., CHICAGO, 60 William St., NEW YORK.

CONTRACTORS FOR ALL KINDS OF FIRE-PROOF WORK IN

Porous Terra-Cotta and Hollow Fire-Clay Tiles

IN ALL PARTS OF THE UNITED STATES.

ILLUSTRATION OF POROUS TERRA-COTTA FIRE-PROOF CEILING.



500000 feet of this ceiling have been put up in Chicago, Milwaukee and Cleveland, and it is now being put in the American Bank-Note building, New York.

Patented April 16, 1878, and March 6, 1883.

All forms of constructive Iron-Work, such as COLUMNS, GIRDERS, and ROOF TRUSSES covered with POROUS TERRA-COTTA and left ready for plastering. Partitions, Furring and Roofing Furnished and Set.

FIRE-PROOF BUILDING MATERIALS.

Raritan Hollow and Porous Brick Company,

Manufacturers of Hollow Burnt-Clay Bricks and Porous Terra-Cotta Bricks,

For Floors, Ceilings, Partitions, Furring, Roof-Lining, Column Fire-Proofing, etc.

Office: 115 BROADWAY, New York. Factory, Raritan River, near Perth Amboy, N. J.

EDWARD KEASBEY, Pres't. J. C. ROSSI, Sup't. H. M. KEASBEY, Sec. and Treas.

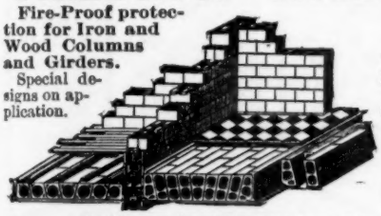
Boston Agents: FISKE & COLEMAN, 62 Congress Street.

☞ Estimates Furnished. Builders Supplied. Send for Illustrated Catalogue. ☜

GEO. M. MOULTON, Pres't. A. T. GRIFFIN, Vice Pres't. E. V. JOHNSON, Sec'y., Treas. and Gen'l. Man'g'r.

FIRE-PROOF HOLLOW BUILDING TILE

Fire-Proof protection for Iron and Wood Columns and Girders. Special designs on application.



FOR THE INTERIOR CONSTRUCTION OF BUILDINGS,

Great strength, combined with saving in space, and weight, is obtained by the use of our system of Hollow Tile Floors, Partition Walls, Roofs, Ceilings, Etc.

Contracts taken for the erection of HOLLOW, SOLID and POROUS TILE-WORK in any part of the United States.

PIONEER FIRE-PROOF CONSTRUCTION CO.,

1545 CLARK STREET, CHICAGO.

Formerly THE OTTAWA TILE CO.,

MANUFACTURERS AND CONTRACTORS,

Dealers in every description of constructive Tile for Building Purposes.

Send for our descriptive Catalogue, giving full explanations, advantages, references, etc.

LEONARD F. BECKWITH, Pres't. & Treas. ARTHUR BECKWITH, Sup't. CHARLES E. STREAT, Sec'y.

Established 1873.

THE FIRE-PROOF BUILDING COMPANY,

NEW YORK.

MANUFACTURERS OF FIRE-PROOF BUILDING MATERIALS.

Porous Terra-Cotta Blocks, Hollow Burnt-Clay Bricks and Tell Lime Composition Blocks. For Arches, Partitions, Furring, Deafening, Roofing, etc.

BUILDERS SUPPLIED.

Office, 229 BROADWAY, (Rooms 12, 13 and 14,) NEW YORK, N. Y.

ESTABLISHED 1856.

HENRY MAURER, Manufacturer of

Fire-Proof Material

Of every description. Hollow Brick made of Clay for Flat Arches, Partitions, Furring, etc. Porous Terra-Cotta, Fire-Brick, etc., etc.

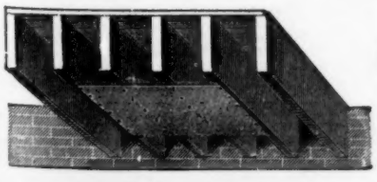
Works, PERTH AMBOY, N. J. Office and Depot, 420 EAST 23d STREET, New York.

LYONS' PATENT FIRE-PROOF

BUILDING MATERIAL,

FRANK LYONS, JR., Sole Manufacturer.

Office Room 60, Drexel Building, Cor. Wall and Broad Sts. Works, Nos. 57 to 65 Clason Ave., Brooklyn. New York Telephone, New 387. Brooklyn Telephone, Williamsburg, 391. Mechanics and Traders' Exchange, No. 14 Vesey St. (Box 82).



The above cut shows the method of applying the sheets of fire-proof material to floor timbers, furrings, etc.

FIRE-PROOF.

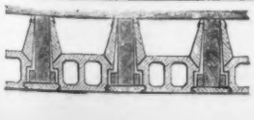
MAGNESO CALCITE FIRE-PROOF CO.,

BOSTON, MASS.

Manufacturers of Fire-Proof Material for the protection of buildings. Indorsed by the leading Architects of Boston.

Send for testimonials of actual fire tests. Every information given by application to the principal office.

72 SUDBURY STREET, BOSTON.



FIRE-PROOF FOR WOODEN BEAMS.

Patented August 8, 1882.

Fire-Proof Tiles for Arches, Partitions, and Furring. Also, Tiles for Protecting Wooden Floor Beams against Fire. Artificial Stone and Rock Asphalt pavements.

JOHN J. SCHILLINGER, 420 East 92d Street, NEW YORK.

Terra-Cotta.

Illustrated Catalogue of 100 pages sent to ARCHITECTS, BUILDERS and OWNERS, upon application accompanied by business card

INDIANAPOLIS

TERRA-COTTA CO.

INDIANAPOLIS, IND.

Manufacturers of

Architectural Terra-Cotta.

Send for estimates.

BALTIMORE

TERRA-COTTA CO.

Office: 30 Columbia St., Baltimore, Md.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA

MOULDED AND PRESSED BRICK.

PERTH AMBOY

TERRA-COTTA CO.

Nos. 80 and 81 Astor House, New York.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA.

BUFF AND COLORED BRICK, FIRE BRICK.

A. HALL

TERRA-COTTA CO.

Architectural Terra-Cotta, Fire-Brick, Furnace-Blocks, &c.

MOULDED, BUFF, AND COLORED BUILDING BRICK.

Perth Amboy, N. J.

Northwestern Terra-Cotta Works.

TRUE, BRUNKHORST & CO.,

ARCHITECTURAL

TERRA - COTTA.

Works: Corner Clybourn & Wrightwood Aves. **Chicago.** City Office: Room 20, McCormick Block

Formerly Cor. W. 15th and Laflin Sts.

Estimates given on application. Send for latest Catalogue, Price-List and Samples.

AUGT. T. CHUR,

Room 14, 5th story, Mills Building, N. York.

Importer of

"WILCOCK'S" Enamelled Bricks,

Impervious to any atmospheric effect, and may be used with perfect safety in the face of moisture and frost.

YOUNG O. WILSON & SON,

Manufacturers of

ARCHITECTURAL TERRA-COTTA.

Best Quality of Plain and Moulded Pressed Brick.

Office, 1 N. Paca Street, Baltimore, Md.

WATER-PROOFING

FOR WALLS

Renders brickwork permanently non-absorbent, prevents weather stains and crumbling mortar-joints; also prevents disintegration of stone without altering the appearance. Can be proved reliable. State-rights for sale under the patent. For ful particulars apply to

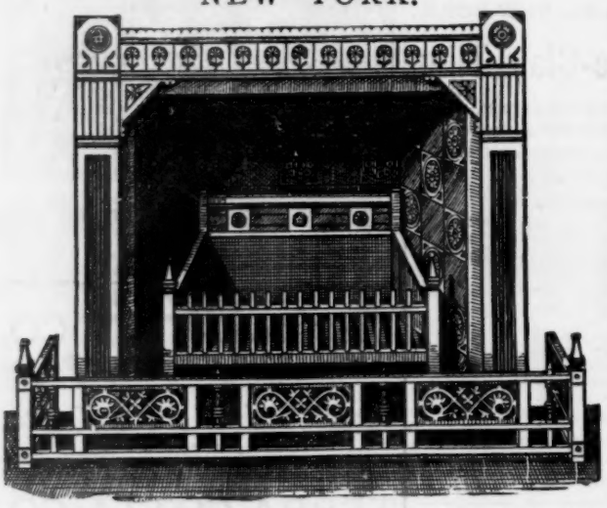
THEODORE HUNT, 413 North 12th St., St. Louis, Mo.

WM. H. JACKSON & CO.

(NO CONNECTION WITH ANY OTHER ESTABLISHMENT).

Union Sq., 2d Door from Broadway, (17th St. side)

NEW YORK.



Manufacturers of Artistic Grates and Fenders in Brass, Real Bronze, Steel and Tile

HAVE NO OTHER WAREROOMS

PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless, Self-Coiling Steel Shutters at Philadelphia, 1876; Paris, 1878; and Melbourne, 1881.

CLARK, BUNNETT & CO. (Limited)

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of Noiseless

Self-Coiling, Revolving STEEL SHUTTERS Fire & Burglar Proof.

Also, ***Improved Rolling Wood Shutters,*** and ***Clark's Patent Metallic Venetian Blinds.***

The BEST in the Market. Send for Catalogues, etc., to

162 and 164 West 27th St. - - New York.

PARQUET FLOORS.

WM. HANNAM & CO.

7-8 inch tongued and grooved, European Styles, Solid and Substantial. Also 5-16 inch Fancy Wood Carpet Floors.

297 Fifth Avenue, NEW YORK.
Formerly 31 East 17th Street.

PARQUET FLOORS.

The National Wood Manufacturing Co.,

16 East 18th St., New York City.

Manufacturers of

INLAID WOOD FLOORS, 5-16 and 7-8 inch thick.

Designs and estimates on application. Established 1867.

"YALE" LOCKS.

FOR ALL PURPOSES. Catalogues on application.

ADDRESS:

The YALE & TOWNE MANUFACTURING CO., STAMFORD, CONN.

62 Reade St., New York. | 15 N. Sixth St., Philadelphia.
224 Franklin St., Boston. | 64 Lake St., Chicago.

Thos. H. Williams, Pres. A. A. Griffin, Vice-Pres. S. D. Tompkins, Tr. J. L. Ogden, Jr., Sec.

A. A. GRIFFING IRON COMPANY,

Steam Heating Apparatus.

Sole Manufacturers of the

Bundy Patent Direct & Indirect Radiators,

Office: 448 Communipaw Ave., Jersey City, N. J.

Funny, aint it?

Why there are more Bundy Radiators in use than any other?

Why is it?

First. Because it is the easiest repaired.

Second. Don't collect dust.

Third. Occupies less room and can be made to fit any space.

Fourth. It will circulate with feed and return on one end.

Fifth. It is adapted to high or low pressure, and is the *only* Radiator for the one pipe system.

Sixth. It is the handsomest and cheapest, and can be shipped knocked down.

Manufactured by the **A. A. GRIFFING IRON CO.,**

594 Communipaw Avenue, Jersey City, N. J.

"Giant Metal Sash Chain."

MADE ONLY BY

THE SMITH & EGGE MANUFACTURING CO.,

BRIDGEPORT, CONN.

The most reliable and economical article in the market for the purpose. GREAT TENSILE STRENGTH Does not corrode; does not lose its vitality by continuous use, or exposure to the elements; runs over any pulley, and gives satisfaction wherever it is used. Fixtures made of steel wire, is very simple and easily applied. Prices very low. Samples sent to any architect in the United States, free, on application. Now in use in State House, Hartford; Providence City Hall; Singer Building, Chicago; J. C. Flood's, Menlo Park, Cal.; Vancornlear and Florence Flats, New York; Boreel Building, New York; new State War and Navy Departments, and Patent Office, Washington, D. C.; *Herald* Building, Boston, and very many other fine buildings in all parts of the United States.

SAYLOR'S PORTLAND CEMENT.

Strongest, Cheapest, Best, and Always Fresh.

JOHNSON & WILSON, Gen. Agts.,

For Sale by all dealers in masons' materials. **91 Liberty Street, New York.**

Sole Agents for **Styrian Tool Steel,** for the United States and Canada.

Send for New Descriptive Pamphlet

Moule's Earth-Closet.

MYERS All China Water-Closet In one piece with Trap combined.

DECECO Siphon Water-Closet and large Stock PLUMBERS' SUPPLIES.

MYERS SANITARY DEPOT,
94 Beekman St., New York.

KEUFFEL & ESSER, - - New York.

EXCELSIOR TAPES

The best tapes ever offered in this market. Correct Distinct, Beautifully Marked and Numbered.

Metallic, All-Linen, Steel, &c., &c.

Special Patterns for Special Purposes Quality Warranted. Write for Circular.

[Established 1865.]

Scenery for Theatres, Public Halls and Amateurs.

Lafayette W. Seavey, 8 Lafayette Place. N. Y.

AMERICAN AND GEM

SPRING HINGES.

Bronze, Brass & Iron,
In Various Styles, and SUPERIOR Finish.

Send for Catalogue.

VAN WAGONER & WILLIAMS CO.,
82 Beekman St., N. Y.

T. WILLIAM HARRIS,

Civil Engineer and Surveyor.

Attention given to any engineering or surveying work. **Special Attention** given to any work required by Architects, such as staking out lots, setting batters for buildings, giving lines and grades for buildings, streets, drives, and drains. Excavation and filling measured.

No. 63 Court Street, Room A,
Cor. Cornhill & Court Sts.

ARTISTIC GRATES AND FENDERS.

OPEN FIREPLACES.

Direct Importers and Dealers in

Foreign and Domestic Tile

of every description and make, including new and original designs solely our own.

Fire Irons, Andirons, Brass Plaques, Jardinieres, &c.

The largest assortment and most elegant show-rooms in America.

J. S. CONOVER & CO.,
30 West 23d Street, - New York.